Diamond Shamrock RI/FS Orders

BEFORE THE

OHIO ENVIRONMENTAL PROTECTION AGENCY

0000001

EPA Region 5 Records Ctr.
253926

In the Matter of:

The Diamond Shamrock Painesville Works Site

Chemical Land Holdings, Inc.
717 North Harwood Street
Dallas, TX 75201

Maxus Energy Corporation
717 North Harwood Street
Dallas, TX 75201

Occidental Chemical Corporation
5005 LBJ Freeway
Dallas, TX 75244

Painesville Township Board of Trustees
55 Nye Road
Painesville, OH 44077

Uniroyal Chemical Company, Inc.
Benson Road
Middlebury, CT 06749

Village of Fairport Harbor
220 Third Street
Fairport Harbor, OH 44077

The Painesville PRP Group
P.O. Box 0188
Painesville, Ohio 44077

Respondents

Director's Final Findings and Orders

PRPs

fees to the Coke Plant

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

PREAMBLE

It is hereby agreed to by and among the Parties as follows:

I. JURISDICTION

1. These Director's Final Findings and Orders ("Orders") are issued pursuant to the authority vested in the Director of the Ohio EPA under Sections 3734.13, 3734.20, 6111.03, and 3745.01 of the Ohio Revised Code and in accordance with Section 104 of CERCLA. As provided herein, Respondents consent to and agree not to contest Ohio EPA's jurisdiction to issue and enforce these Orders.

II. PARTIES BOUND

2. These Orders shall apply to and be binding upon Respondents and their respective successors and assigns. Upon Respondents' request, these Orders may

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

under Section 3734.01(J) of the Ohio Revised Code; (2) any "solid waste" under Section 3734.01(E) of the Ohio Revised Code; (3) any "industrial waste" under Section 6111.01(C) of the Ohio Revised Code; (4) any "other waste" under Section 6111.01(D) of the Ohio Revised Code; and (5) any "hazardous substance" under Section 101(14) of CERCLA.

d. "Interim Action" is any limited, accelerated response action conducted in a manner consistent with the NCP and Ohio law, taken to prevent, minimize, or mitigate a substantial threat to the public health or safety or to the environment resulting from a release or threat of release of Hazardous Substances. To the extent practicable, the actions taken under an Interim Action should contribute to the efficient performance of any anticipated long-term remedial action with respect to the release concerned.

e. For the purposes of providing a copy of these Orders under paragraph 4, "Major Contractors, Subcontractors, Laboratories and Consultants" shall mean those contractors, subcontractors, laboratories and consultants who engage in environmental investigation required under these Orders involving drilling, sampling, analytical analysis, and oversight of environmental investigation, if the fees for such environmental investigation are reasonably anticipated to exceed $100,000 in any one calendar year or if Ohio EPA specifically directs that they be provided a copy of these Orders.

f. "NCP" or "National Contingency Plan" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan, codified at 40 C.F.R. Part 300 (1990), as amended.

g. "Ohio EPA" shall mean the Ohio Environmental Protection Agency and its designated representatives.

h. "Paragraph" shall mean a portion of these Orders identified by an Arabic numeral or an upper or lower case letter.

i. "Party" or "Parties" shall mean Respondents and/or the Ohio EPA.

j. "Remedial Investigation and Feasibility Study" ("RI/FS") shall mean those activities to be undertaken to determine the nature and extent of the contamination at the Site caused by the disposal, discharge, or release of Hazardous Substances and those activities to be undertaken pursuant to these

OHIO E.P.A.
SEP 27 96
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-96

Orders to develop and evaluate remedial alternatives to address such contamination.

k. "Remedial Investigation and Feasibility Study Work Plan" ("RI/FS Work Plan", or "Work Plan") shall mean the document submitted by Respondents pursuant to Paragraph 12 of these Orders.

l. Subject to Paragraph 2, "Respondents" shall mean The Painesville PRP Group (membership as listed in "Waiver and Agreement" below), Chelmsford Properties, Inc., Chemical Land Holdings Inc., Dartron Corporation, Environmental Brine Services, Inc., Fairport Village Board of Education, Steven W. and Calvina J. Gagat, John Grantham, Hach Excavation and Demolition, Inc., Paul W. and Marlene E. Hach, James Paul Management, Inc., Ralph M. Lederer, Little Seedlings, Maxus Energy Corporation, Occidental Chemical Corporation, Painesville Township Board of Trustees, RDL Properties, Schuster Service Inc., Uniroyal Chemical Company, Inc., the Village of Fairport Harbor.

m. "Section" shall mean a portion of these Orders identified by a Roman numeral except when "Section" is used as a part of a reference to a statutory or regulatory provision.

n. "Site" shall mean the former Diamond Shamrock Painesville Works site, which has also been proposed for the National Priorities List under CERCLA, located part in the Village of Fairport Harbor, part in the city of Painesville, and part in Painesville Township, Lake County, Ohio, in parts of which the release, treatment, storage, and/or disposal of Hazardous Substances, and/or the discharge into waters of the State of Hazardous Substances has occurred, including any other area where such Hazardous Substances may have migrated or threaten to migrate, which is described more particularly on the attached map contained in Appendix C.

o. "Statement of Work" ("SOW") means Ohio EPA's generic statement of work for the implementation of an RI/FS, as set forth in Appendix A to these Orders. The SOW is not specific to this Site, and shall be used as a guiding outline in developing Site-specific work plans.

p. "U.S. EPA" shall mean the United States Environmental Protection Agency, the Regional Administrator for Region V, and their designated

OHIO E.P.A.
SEP 27 95
...ED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

representatives.

q. "Work" shall mean all RI/FS activities Respondents are required to perform under these Orders.

IV. FINDINGS OF FACT, DETERMINATIONS, AND CONCLUSIONS OF LAW

7. Ohio EPA has determined that all findings of fact, determinations, and conclusions of law necessary for the issuance of these Orders pursuant to Sections 3734.20, 3734.13, 3745.01 and 6111.03 of the Revised Code have been made and are outlined below. By entering into these Orders or by acting (or failing to act) in connection with these Orders and the Work Plan, Respondents do not admit the Findings of Fact, Determinations and Conclusions of Law set forth below, any of the allegations contained in these Orders, any issues of law or fact or any responsibility for the alleged release or threat of release of Hazardous Substances into the environment, and these Findings of Fact, Determinations and Conclusions of Law do not constitute evidence against Respondents. Ohio EPA has determined the following:

a. The Diamond Shamrock Chemicals Company (formerly named Diamond Alkali Company and Diamond Shamrock Corporation, and now Occidental Chemical Corporation as a result of a 1986 stock sale and subsequent merger) (hereinafter referred to as "Diamond Shamrock") began operations at the Painesville Works in Lake County in 1912. The Diamond Shamrock Site (defined in Section III, Definitions) is approximately 1100 acres in size and is described in Appendix C. The Site includes all known areas of manufacturing or other industrial use, areas of waste disposal, and other areas which are or may be contaminated. Diamond Shamrock began shutting down the Painesville Works in 1972, and the last Painesville Works operations ceased in 1977. Between 1912 and 1977, and from 1977 to the present, numerous others conducted activities of various duration at different locations within the Site.

b. Aluminum Smelting and Refining Company, Dartron Company, Diamond Shamrock, Electrode Corporation, Erie Coke and Chemical Company (now Scepter Management Corporation), Glen L. Martin Company (now Martin-Marietta Corporation), LTV Steel Company (including its predecessors, Youngstown Sheet and Tube Company, Jones and Laughlin Steel Corporation) and Republic Steel

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

Corporation), Nacelle Land and Management Corporation, Pressure Vessel Services of Ohio, Inc. (PVS), Standard Machine & Equipment Company Inc. (SME), U.S. Rubber (now Uniroyal Chemical Co. Inc.) and others produce or produced, conduct or conducted activities involving, a variety of substances and/or materials during their respective operations at the Site, including: sodium hydroxide (caustic soda); hydrochloric acid (muratic acid); chlorinated paraffins (Chlorowax); bicarbonate of soda (baking soda); magnesium oxide; coke; carbon tetrachloride; hydrogen and liquid hydrogen; ammonia; benzene, toluene and related hydrocarbons; calcium carbonate; cement; sal soda; lye; cleaners (soaps); sodium carbonate (Soda Ash); chlorine; sodium bichromate; chromic acid; potassium bichromate; sodium sulfate; vinyl chloride monomer and polyvinyl chloride; pickle liquor; fly ash; secondary metals; and others.

c. Diamond Shamrock's primary production facility was the Soda Ash/Solvay Process Plant, which began operations in 1912. Soda ash was produced using the Solvay Process. The main feedstock for this process was salt extracted using brine solution mining wells (44 over the life of the plant) on and near the Site, coke, and limestone. In addition to soda ash, the Soda Ash Plant produced sodium carbonate, magnesium oxide and sodium bicarbonate (baking soda). In 1915, the Soda Ash Plant began producing sodium hydroxide. The Soda Ash Plant and supporting facilities (including the Power Plant), which together occupied approximately 75 acres, ceased operations in 1976. Many of the Painesville Works buildings were torn down by Standard Machine & Equipment Company (SME), after SME purchased the main production area of the Painesville Works (north of Fairport-Nursery Road) and the area of the former Hydrobasin in 1978. The main plant area was graded, a layer of clay and soil was added, and grass was planted.

d. The wastes from the Soda Ash Plant included ammonia and wastewater containing dissolved and suspended solids including calcium chloride (road salt), sodium chloride and unreacted limestone. The wastewater was generated at a rate of 6 million gallons per day (GPD). Approximately 400 tons/day of solids (calcium, sodium, magnesium carbonate, sulfates, sand, and unreacted limestone) were entrained in this wastewater stream and settled out of solution in basins known as Waste Lakes #1, #2, #3 and #4, all of which are now

OHIO E.P.A.
SEP 27 95
CED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

dry. The settling basins were used sequentially, so that creation and use of the next basin began when use of the existing basin was discontinued. The basins were numbered in order of use; Settling Basin #1 was used first and Settling Basin #4 was used last. During the peak production stage of the Painesville Works' operations, clarified water from Settling Basin #4 was discharged into the Grand River at a rate of 6 million GPD under a permit with parameters for dissolved and suspended solids, chlorides and pH. During much of the time that Settling Basin #4 was used, the clarified water was directed to the former Hydrobasin (now also dry) for additional settling before discharge to the Grand River. Beginning in 1966, "pickle liquor" (hydrochloric acid which had been used to remove corrosion from steel), containing iron chloride and sulfate and other metal solids, was sent to the Site by Youngstown Sheet and Tube Company, Jones and Laughlin Steel Corporation, and Republic Steel Corporation (all acquired by or merged into the LTV Steel Company). The pickle liquor was used at a rate of 40,000 GPD to aid in the precipitation of the suspended solids in, and to neutralize, the process wastewater stream (6 million GPD) from the Soda Ash Plant.

e. Diamond Shamrock operated its own Power Plant within the Site throughout the life of the Painesville Works. Materials created by the Power Plant included fly ash and bottom ash, which were deposited in Settling Basins #1, #2, and #3. The noncontact cooling water stream from the Power Plant, generated at a rate of 70-90 million GPD, was routed to the Hydrobasin and, subsequently, to the Grand River.

f. Diamond Shamrock produced coke at the Site for use in its own production processes or for sale to foundries. In 1924 byproduct coke ovens were constructed. The ovens recovered the ammonia, gas and tar distillates which resulted from the coking process. The gas was sold as fuel and for domestic heating. The ammonia was utilized in the Solvay Process at the Soda Ash Plant. The tar distillates were refined into benzene, toluene and other related hydrocarbons for sale to third parties.

g. In 1976, Erie Coke and Chemical Company (now Scepter Management Corporation) purchased the Coke Plant as an ongoing operation from Diamond

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

Shamrock, as well as the 40-acre parcel on which the Coke Plant was located. Erie Coke and Chemical continued to operate the Coke Plant until 1982. Erie Coke and Chemical produced approximately 425 tons of coke per day, and used metal oxide filings for air cleanup, which generated metal oxide residue and coke tar decanter sludge (K087) waste. Both the metal oxide filings and K087 waste were stored on the property for greater than 180 days, resulting in a violation of hazardous waste laws by Erie Coke and Chemical. Erie Coke and Chemical was notified in 1984 that the metal oxide filings tested EP Toxic for chromium and that the coke tar decanter sludge was a listed hazardous waste. Wastewater from Erie Coke and Chemical's operations contained ammonia, cyanide, phenols, oil and grease. The wastewater sludge tested EP Toxic for chromium (7.5 mg/L) on February 6, 1984. The EP Toxicity level for chromium at that time was 5 mg/L.

h. Both the metal oxide filings and K087 wastes were left on the 40-acre Coke Plant property by Erie Coke and Chemical when it sold the 40-acre parcel to National GG. National GG purchased the property with the intent of demolishing on-site structures. In late 1987, during National GG's demolition activities, open burning complaints were investigated by the Ohio EPA and Lake County General Health District officials. Open burning on the property was observed by the officials. Also during National GG's demolition activities, a cooling tower containing K087 waste was dismantled and the waste spilled on the ground. Samples taken on February 8, 1988 indicated the presence of K087 constituents in soils. Other on-site soil samples collected on January 4, 1988 indicated heavy metals and up to 5192 ppb naphthalene.

i. The Standard Portland Cement plant was built and operated by Diamond Shamrock from 1925 until 1956. The feedstock at the Cement Plant was lime and calcium carbonate, and the product was cement. The cement was shipped by truck and rail. In April 1980, the Cement Plant was sold "as is" to Aluminum Smelting and Refining Company, Inc., and it has been operated as a secondary scrap metals smelter since that time.

j. The Chlor Alkali Plant was built by Diamond Shamrock in 1929, and operations began in 1930. Chlorine and caustic were manufactured using diaphragm cells (which contained asbestos) rather than the conventional mercury cells (one

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 '95
LD DIRECTOR'S JOURNAL

mercury cell was used briefly on an experimental basis only). The feedstock was sodium chloride, which was obtained from brine wells located on and near the Site. Other products from the Chlor Alkali Plant included sodium hydroxide, hydrogen, and hydrochloric and muratic acid. Power to run the electrolytic cells was generated from the onsite Power Plant, and supplemented with electricity from CEI. The major wastewater stream was noncontact cooling water, which was discharged to the Grand River via the former Hydrobasin. The Chlor Alkali Plant ceased operations in 1976, and was sold to SME. SME demolished the Chlor Alkali Plant. The area was graded, a layer of clay and soil was added, and grass was planted.

k. Diamond Shamrock constructed a Carbon Tetrachloride Plant in 1933 and operated it until 1976. Diamond Shamrock also operated a Chlorowax Plant, which produced chlorinated paraffins, from 1944 until 1977 (it was the last of the Diamond Shamrock operations to shut down), and a Hydrochloric Acid (HCl) Plant, from 1930 until 1976. SME demolished these plants, and the areas were graded, a layer of clay and top soil was added, and grass was planted.

l. Diamond Shamrock operated the Chrome Plant south of Fairport Nursery Road from 1931 until 1972. The Chrome Plant produced chromic acid and sodium and potassium bichromates. Waste from the Chrome Plant (Chromium Ore Processing Residue, or "COPR", which contained hazardous levels of hexavalent chromium) was placed on the Chrome Plant property (approximately 750,000 tons). As described below, process wastewater was sent to the Milk of Lime Pond and runoff was directed to the Impounding Basin; both the Milk of Lime Pond and the Impounding Basin were located on Chrome Plant property.

m. Many of the products from the Site were shipped on rail spurs and a rail system owned and operated by the Norfolk & Western Railway Company (formerly the Fairport, Painesville and Eastern Railroad Company), a subsidiary of Norfolk Southern Corporation. This rail system occupied 25 acres, and included a roundhouse, carshop, offices, tower building and maintenance facilities.

n. Diamond Shamrock began using former Settling Basin #1, which was located north of Fairport-Nursery Road and west of the main production area of

OHIO E.P.A.
SEP 27 '95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

the Painesville Works, in 1912 to settle the solids from the inert wastewater from the Soda Ash Plant. Settling Basin #1 also received fly ash and bottom ash from the onsite Power Plant. Use of Settling Basin #1 was discontinued in 1920, before any of the other plants at the Painesville Works began operations.

o. Former Settling Basin #2, the Chrome Plant and the Chrome Plant's Milk of Lime Pond and Impounding Basin occupy an area of over 100 acres. This area is situated in the central portion of the Site and is bounded to the north by Fairport-Nursery Road and to the south by the Grand River. Following the discontinuation of use of Settling Basin #1, Settling Basin #2 was used to settle the solids from the Soda Ash Plant process wastewater until sometime prior to 1937. Settling Basin #2 also received fly ash and bottom ash from the onsite Power Plant. The Milk of Lime Pond, located at the Chrome Plant, received Chrome Plant process wastewater. This wastewater contained chromium, some of which was in hexavalent form. The waste stream was first treated with sulfur dioxide to reduce any hexavalent chromium to trivalent form, and then reacted with lime to precipitate out the insoluble trivalent chromium. In 1966, the sulfur dioxide was replaced with pickle liquor to aid in the reduction of the hexavalent chromium. Until 1967, the treated waste stream was combined with alkaline lime prior to deposition in the Milk of Lime Pond. From 1967 to 1972, the treated waste stream was co-mingled with process wastewater from the Soda Ash Plant (at Settling Basin #4) to aid in pH control. The Impounding Basin, also located at the Chrome Plant, contained primarily stormwater runoff from the Chrome Plant. In 1978, Diamond Shamrock began closing the Chrome Plant and surrounding area. (including former Settling Pond #2, Milk of Lime Pond and the Impounding Basin) using fly ash and a clay cap. The 750,000 tons of COPR generated at the Chrome Plant was capped; none of the COPR was hauled offsite for disposal. On August 21,1980, the Ohio EPA granted a Permit to Install to Diamond Shamrock for the disposal of fly ash on top of this area. The fly ash, supplied by CEI, was deposited as a first layer over the COPR (as a barrier to stop any upward capillary action). The fly ash was covered with clay and topsoil, and the area was seeded, as part of an engineered closure. No chromium has been detected wicking up through the closure.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cain Date 9-27-95

OHIO E.P.A.
SEP 27 95
DIRECTOR'S JOURNAL

p. On July 14, 1983, the U.S. EPA entered into an Administrative Consent Order (ACO) with Diamond Shamrock for the capping, fencing and monitoring of the area described in the preceding paragraph (CA No. C80-1857). Surface soil samples collected on October 31, 1979 contained 16,900 ppm total chromium and 14.40 ppm total lead. Monitoring wells were installed on the closed area. The ACO requires sampling of the Grand River, sampling of the monitoring wells, and site inspections. Ground water sampling from 1992 through 1994 indicate significant levels of hexavalent and total chromium in the vicinity of former Settling Basin #2 and the former Impounding Basin area.

q. Diamond Shamrock utilized former Settling Basin #3, located south of Fairport-Nursery Road and on the western edge of the Site, beginning around 1937. Wastes directed to Settling Basin #3 primarily included Solvay Process wastewater from the Soda Ash Plant, with substantially lesser amounts of runoff from the Painesville Works (excluding runoff from the Chrome Plant, which went to the Impounding Basin), Coke Plant wastewater, Chlorowax Plant wastewater, noncontact cooling water from the Power Plant, and Chlor Alkali Plant wastewater. The runoff, Coke Plant wastewater, Chlor Alkali Plant wastewater, and wastewater from the Chlorowax Plant formed a single waste stream that consisted of cooling water, stormwater, trace amounts of asbestos from the chlorine cells, acid wastes and ammonia still wastes. The area of Settling Basin #3 also received fly ash and bottom ash from the onsite Power Plant and from Cleveland Electric Illuminating's off site power plant. For a brief period in the late 1960's and early 1970's (after use of Settling Basin #3 for settling Solvay Process wastewater from the Soda Ash Plant had discontinued) spent pickle liquor from LTV Steel's predecessors was placed on an experimental basis in a pit constructed within former Settling Basin #3 to aid in pH control. Some Chrome Plant wastewater was also placed in former Settling Basin #3 on an experimental basis to aid in pH control and to facilitate precipitation of trivalent chromium from the wastewater. The remains of unidentified drums were found in the area of former Settling Basin #3 by the Ohio EPA and U.S. EPA during a Site visit on June 11, 1993. Diamond Shamrock operated a solid waste refuse dump during some period of the Painesville Works operations in the northeastern portion of former

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

Settling Basin #3.

r. On December 31, 1953, Diamond Shamrock leased sixteen acres in the southwest portion of former Settling Basin #3 to the Village of Fairport Harbor. The Village created and operated a municipal waste landfill on the property, which it now owns, from approximately 1968 until approximately 1989. By letter dated January 18, 1995, the Lake County General Health District notified the Village that the dumping of leaves on its property constituted violations of state solid waste rules. In addition, the Village constructed a paved road on its property without authorization of the Director of the Ohio EPA, as required by Ohio Administrative Code Section 3745-27-13.

s. Former Settling Basin #4 was located on the southern portion of the Site and was bounded by the Grand River on the north and east, Elm Street and State Route 2 on the south, and by parcels owned by Painesville Township and the City of Painesville on the west. The area that includes former Settling Basin #4 is approximately 430 acres in size. From sometime after 1937 until 1976, Settling Basin #4 was used to settle the solids from the Soda Ash Plant's Solvay Process wastewater (after use of Settling Basin #3 was discontinued). In addition, some process wastewater from the Chrome Plant, titanium wastes from the Electrode Corporation and spent pickle liquor from LTV Steel (including its predecessors) were deposited within Settling Basin #4. The pickle liquor and titanium wastes were stored in tanks on the southern edge of Settling Basin #4, and were added to Solvay Process wastewater from the Soda Ash Plant for pH control and to aid in the precipitation of suspended solids. This mixture was also used to assist in converting the hexavalent chromium in the wastewater stream from the Chrome Plant into trivalent chromium. The Settling Basin #4 area is dry and partially vegetated, but uncapped, and the area is leaching dissolved solids into the Grand River.

t. The area of the former Hydrobasin lies between former Settling Basins #2 and #3, and is bordered to the north by Fairport-Nursery Road. The former Hydrobasin accepted runoff from the main Painesville Works production areas (except runoff from the Chrome Plant, which was directed to the Impounding Basin), Coke Plant wastewater, HCl and Chlorowax Plant wastewater, Chlor Alkali

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

Plant wastewater, and decanted wastewater from Settling Basin #4. Following the cessation of Diamond Shamrock's operations, demolition rubble from the various plant buildings was placed in the former Hydrobasin as fill material.

u. The geology of the Site consists of alluvial and lacustrine deposits comprised of sands, silts, clays and gravels. Glacial till underlies these deposits. Bedrock in the area, which lies an average of 20 to 50 feet below the original surface of the land, is shale, and the bedrock is underlain by a massive salt formation. Geology of the area may be conducive to the transport of wastes through groundwater. Area residents in the vicinity of the Site generally utilize public water supplies.

v. The Ohio Water Quality Standard limit for hexavalent chromium in a warm water habitat, such as the Grand River, is 11 ug/l (ppb) (.01 ppm). Exceedances of the Water Quality Standard for hexavalent chromium have continued in the Grand River, even after the capping of the former Settling Basin #2, the Impounding Basin, and the Milk of Lime Pond areas. Water Quality Standard exceedances for total recoverable iron and total dissolved solids have occurred in the portion of the Grand River adjacent to the former Settling Basins.

w. The Ohio EPA performed sediment and fish tissue sampling of the Grand River in the vicinity of the Site during September 1994. Sediments were found to contain levels above upstream levels of arsenic, cadmium, calcium, chromium, copper, lead, zinc, hexavalent chromium, nickel, manganese, vanadium, mercury, 4,4'-DDD, 4,4'-DDT, aluminum, beryllium, cobalt, iron, phenanthrene, fluoranthrene, pyrene, benzo(a)anthracene, bis(2-ethylhexyl)phthalate, chrysene, and total organic carbon. Fish tissue samples were found to contain levels of 4,4'-DDE, Endrin aldehyde, bis (2-ethylhexyl) phthalate, chromium, mercury, PCB-1260, cadmium, Heptachlor epoxide, Di-n butyl phthalate, dieldrin, 4,4'-DDT, 4,4'-DDD, and PCB-1254. Results of fish tissue analyses have been sent to the Ohio Department of Health for interpretation.

x. An oxbow which existed in the Grand River to the south of the Chromium Plant was filled with waste, as was the old river channel, which once meandered through the Settling Basin #3 area.

y. From 1963 until 1970, Diamond Shamrock operated the One Acre

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 '95
ENTERED DIRECTOR'S JOURNAL

Landfill for disposal of research wastes from its research laboratories in Fairport, Chardon, Ashtabula and Concord Township. Containers of waste were inventoried and buried by Diamond Shamrock in trenches excavated 15 to 20 feet deep and 8 to 10 feet wide. Wastes include: methyl methacrylate, diisocyanate wastes, hexachlorobutadiene, polymercaptan wastes, orthodichlorobenzene, formaldehyde, cyanuric acid, trichlorophenol, xylene, caustic soda, hexachlorobenzene, pesticides and herbicides, polymercaptan, acetone, heptane, isocyanate, caustic potash, toluene with polymercaptan, chromic acid wastes, and chlorinated xylene wastes.

z. In 1988, Chemical Land Holdings, Inc. (which owns the land on which the One Acre Landfill is located) voluntarily initiated a site stabilization at the One Acre Landfill, with a cover, slurry wall construction and an extraction well collection system. The leachate has been pumped from the extraction wells since 1984, and disposed of when a sufficient volume has accumulated in the wells. The leachate is shipped to a permitted off-site hazardous waste disposal facility. In addition, Chemical Land Holdings voluntarily installed a shoreline stabilization system to protect the One Acre Landfill from erosion of the Lake Erie shoreline. The One Acre Landfill is located approximately fifty feet from the banks of Lake Erie.

aa. Following the end of Diamond Shamrock's operation of the Painesville Works at the Site, various parcels of property within the Site were sold to different entities. Much of the main plant area of the Painesville Works, as well as the area of the former Hydrobasin, was sold to SME, which in turn sold some of the parcels to others for industrial and commercial use. Currently, ownership of different portions of the Site rests with a variety of individuals, partnerships, corporations, and government entities.

bb. In September, 1986, the stock of Diamond Shamrock was sold to an affiliate of Occidental Chemical Corporation ("OCC"). Subsequently, Diamond Shamrock was merged into OCC.

cc. In May, 1993, U.S. EPA proposed placing the Diamond Shamrock Painesville Works Site on the National Priorities List, describing a threat to the drinking water intakes along Lake Erie, and to fisheries, wetlands and

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

OHIO E.P.A. SEP 27 95 DIRECTOR'S JOURNAL

sensitive environments in the Grand River and Lake Erie.

dd. On October 1, 1992, the Ohio EPA entered into a Cooperative Agreement with the U.S. EPA to act as lead agency under CERCLA with respect to the Site. In February, 1995, Ohio EPA issued special notice letters with an invitation to participate in negotiations for an administrative consent order to: Ace Lakefront Properties, Aluminum Smelting and Refining Co., Inc., Chelmsford Properties, Inc., Chemical Land Holdings, Dartron Corporation, Electrode Corp., Environmental Brine Services, Inc., Fairport Village Board of Education, Steven W. and Calvina J. Gagat, John Grantham, Hach Excavation and Demolition, Inc., Paul W. and Marlene E. Hach, James Paul Management, Inc., Lake County Commissioners, Lake Underground Storage, Ralph M. Lederer, Little Seedlings, Martin Marietta Corp., Maxus Energy Corporation, Nacelle Land and Mortgage Corporation, National GG Industries, Norfolk & Western Railway Co., Occidental Chemical Corporation, Painesville Township Board of Trustees, Pressure Vessel Service of Ohio, Inc., RDL Properties, Roadway Express, Inc., Scepter Management Corporation, Schuster Service Incorporated, Standard Machine and Equipment, Tanner Industries, Uniroyal Chemical Co., Inc., and the Village of Fairport Harbor. The following persons agreed and are Respondents to this Order: Chelmsford Properties, Inc., Chemical Land Holdings, Dartron Corporation, Environmental Brine Services, Inc., Fairport Village Board of Education, Steven W. and Calvina J. Gagat, Hach Excavation and Demolition, Inc., Paul W. and Marlene E. Hach, James Paul Management, Inc., Little Seedlings, Maxus Energy Corporation, Occidental Chemical Corporation, Painesville Township Board of Trustees, Schuster Service Incorporated, Uniroyal Chemical Co., Inc., and the Village of Fairport Harbor.

ee. Ace Lakefront Properties is the current owner of the parcel of land identified as III on Appendix C. Ace Lakefront Properties is a "person" as defined by ORC 3734.01(G).

ff. Aluminum Smelting & Refining Company (ASR), a recycling facility which produced aluminum ingots, is the current owner and former operator of the parcel identified as IX on Appendix C. ASR submitted surveys which showed elevated levels of chromium on this parcel. ASR is a "person" as defined by ORC

OHIO E.P.A.
SEP 27 '95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

Section 3734.01(G).

gg. Chelmsford Properties, Inc., is the current owner of the parcel of land identified as VII.B. on Appendix C. Chelmsford Properties, Inc., is a "person" as defined by ORC 3734.01(G).

hh. Chemical Land Holdings Inc. an indirect wholly-owned subsidiary of Maxus Energy Corporation is the current owner and operator of the parcels identified as II, IV, 1, A, C-1, A-6 and A-8 on Appendix C.

ii. Dartron Corporation, a recycler of scrap ferrous and non-ferrous metal, is the current owner of the parcel of land identified as X on Appendix C. This parcel was purchased from Uniroyal, Inc. Diamond Shamrock is not known to have used this parcel for manufacturing or waste disposal. Dartron Corporation is a "person" as defined in ORC Section 3734.01(G).

jj. Electrode Corporation, a wholly-owned subsidiary of ELTECH System Corporation, generated liquid titanium wastes which were disposed in Settling Basin #4. Electrode Corporation is a "person" as defined in ORC Section 3734.01(G).

kk. Environmental Brine Services is the current owner of the parcel of land identified as C-4 on Appendix C. Environmental Brine Services is a "person" as defined by ORC Section 3734.01(G).

ll. Fairport Village Board of Education, a political subdivision of the State of Ohio, accepted as a gift and is the current owner of the parcels of land identified as C-2 and A-1 on Appendix C. Fairport Village Board of Education is a "person" as defined by ORC Section 3734.01(G).

mm. Steven and Calvina Gagat are the current owners of the parcel of land identified as A-3 on Appendix C. Steven and Calvina Gagat are "persons" as defined by ORC Section 3734.01(G).

nn. John Grantham is the current owner of the parcel identified as A-5 on Appendix C. John Grantham is a "person" as defined by ORC Section 3734.01(G).

oo. Hach Excavation & Demolition, Inc., a demolition, clearing and grading business, is the current owner and operator of the parcel of land identified as 3 on Appendix C and is the current operator of the parcel

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

identified as 2 on Appendix C. Hach Excavation & Demolition, Inc., is a "person" as defined by ORC Section 3734.01(G).

pp. Paul and Marlene Hach are the current owners of the parcels identified as 2 and 4 on Appendix C. Paul and Marlene Hach are "persons" as defined by ORC Section 3734.01(G).

qq. James Paul Management is a current owner of two parcels of land within the Site, identified as parcels VII D and VII E on Appendix C. James Paul Management is a "person" as defined in ORC Section 3734.01(G).

rr. Lake County Board of Commissioners, a political subdivision of the State of Ohio, is the current owner of the parcel of land identified as V in Appendix C. This land was purchased from Diamond Shamrock Corp. Lake County Board of Commissioners is a "person" as defined by ORC Section 3734.01(G).

ss. Lake Underground Storage Corporation, a buyer, seller, and distributor of liquid petroleum gas products and related activities, is the current owner of the parcel of land identified as D on Appendix C. Lake Underground Storage Corporation operated injection wells in the vicinity of the Settling Basin #4 area. Lake Underground Storage Corporation is a "person" as defined in ORC Section 3734.01(G).

tt. Ralph M. Lederer is the current owner of the parcel identified as VII.F. on Appendix C. Ralph M. Lederer is a "person" as defined by ORC Section 3734.01(G).

uu. Little Seedlings, Inc., a railroad distribution operator, is the current owner of the parcel identified as C-3 on Appendix C, and is the current operator of parcels identified as 4 and C-3 on Appendix C. Little Seedlings, Inc., is a "person" as defined by ORC Section 3734.01(G).

vv. Martin Marietta Corporation, as a successor to the Glen L. Martin Company, operated a vinyl chloride and polyvinyl chloride monomer production facility on the Site, and is the former owner and operator of the parcel of land identified as X on Appendix C. Martin Marietta Corporation is a "person" as defined by ORC Section 3734.01(G).

ww. Maxus Energy Corporation owned the stock of Diamond Shamrock from 1983 to 1986. Maxus Energy Corporation's indirect wholly-owned subsidiary,

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 '95
...ED DIRECTOR'S JOURNAL

Chemical Land Holdings Inc., is the current owner of the parcels of land identified as II, IV, 1, A, C-1, A-6 and A-8 on Appendix C. Maxus Energy Corporation has operated and maintained a portion of the Site, carried out response activities and has exercised environmental management over portions of the Site. Maxus Energy Corporation has also disposed of, or authorized the disposal of, solid waste on the Site, in violation of Ohio Administrative Code (OAC) Section 3745-27-05(C) and OAC Section 3745-27-01(CC). Statements made by Occidental Chemical Corporation, the successor by merger to Diamond Shamrock, indicate that Maxus Energy Corporation has acted, and continues to act, on behalf of Occidental Chemical Corporation with respect to the Site. Maxus Energy Corporation is a "person" as defined by ORC Section 3745.01(G).

xx. Nacelle Land & Management Corporation, which disposes of oil field brine (by injection into mining wells formerly used by Diamond Shamrock for brine solution mining and converted for deep well injection) received from well sites and licensed haulers, is the current owner of a 484.73-acre parcel of land identified as G-1 on Appendix C. Nacelle Land & Management Corporation is a "person" as defined in ORC Section 3734.01(G).

yy. National GG Industries, which purchased the Coke Plant property from Erie Coke and Chemical Company (now Scepter Management) in 1983, is the former owner and operator of the parcel of land identified as III on Appendix C. National GG in 1986 began demolition of Erie Coke facilities. In 1988, the Ohio EPA requested that all demolition cease, as there was evidence that hazardous waste was being released as a result of the demolition. National GG Industries is a "person" as defined by ORC Section 3734.01(G).

zz. Norfolk & Western Railroad Company, the successor to the Fairport, Painesville, and Eastern Railroad Company (FP&E RR), is the current owner of 25 acres of parcels identified as 1-A and 1-B on Appendix C and has been the operator of the rail system, including a roundhouse (repair yard) and rail spurs, that traverses the Site since at least 1912. Norfolk Southern is a holding company that owns all the common stock of and controls a major freight railroad and motor carrier. Norfolk Southern Corporation is a "person" as defined in ORC Section 3734.01(G).

OHIO EPA
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

aaa. Occidental Chemical Corporation, a subsidiary of Occidental Petroleum Corporation, is the successor by merger to Diamond Shamrock, the former owner/operator of the Painesville Works and surrounding property within the Site. Occidental Chemical Corp. is a "person" as defined by ORC Section 3734.01(G).

bbb. Painesville Township Board of Trustees, a political subdivision of the State of Ohio, is the current owner of the parcel of land identified as E on Appendix C. Painesville Township Board of Trustees previously used the property for a municipal solid waste disposal facility from approximately 1961 to the early 1970s. Painesville Township Board of Trustees is a "person" as defined by ORC Section 3734.01(G).

ccc. Pressure Vessels Services of Ohio, Inc. (PVS), a distributor of chemicals, is the current owner and operator of the parcel of land identified as VIII on Appendix C. PVS negotiated for and obtained the right to dispose of pickle liquor on former Settling Basin #4. PVS is a "person" as defined by ORC Section 3734.01(G).

ddd. RDL Properties, Inc., a partnership, is the current owner of the parcel of land identified as VII.C. on Appendix C. RDL Properties is a "person" as defined by ORC Section 3734.01(G).

eee. Roadway Express, Inc., a trucking/shipment company that became a wholly-owned subsidiary of Roadway Services, Inc. in 1982, is the current owner and former operator of the parcel of land identified as A-2 on Appendix C. Roadway Express, Inc. is "person" as defined by ORC Section 3734.01(G).

fff. Scepter Management Inc., as successor to Erie Coke and Chemical Company, is the former owner and operator of the Coke Plant property identified as III on Appendix C. Scepter Managment disposed of, at least, iron oxide filings and coal tar decanter sludge on the Coke Plant property. Scepter Management may also have contributed to the condition of the Coke Plant property as the entity ultimately responsible for the shutdown of the Coke Plant operations and demolition of the Coke Plant structures. Scepter Management is a "person" as defined in ORC Section 3734.01(G).

ggg. Schuster Service, Inc., a towing and repair company located in Fairport Harbor, Ohio, is the current owner and operator of the parcel of land

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

identified as VII.G. and VI.A. on Appendix C. Schuster Service, Inc. is a "person" as defined in ORC Section 3734.01(G).

hhh. Standard Machine and Equipment Company (SME), a machine demolition and removal company, is the current owner of the parcels of land identified as B, VI.B. and VI.C. on Appendix C. SME was involved in the demolition, scrapping of metal, and removal of equipment and facilities at the Painesville Works. Standard Machine and Equipment Company is a "person" as defined by ORC Section 3734.01(G).

iii. Tanner Industries, Inc., a distributor of anhydrous ammonia, is the current owner and operator of the parcel of land identified as VII.H. on Appendix C. Tanner Industries, Inc. is a "person" as defined in ORC Section 3734.01(G).

jjj. Uniroyal Chemical Company, Inc., is the successor in interest to the chemical business of Uniroyal, Inc., a former owner of the parcel of land identified as X on Appendix C, which Uniroyal, Inc. purchased from the Glen L. Martin Company (now Martin Marietta Corporation). Uniroyal operated a vinyl chloride monomer and polyvinyl chloride plant on this parcel. Diamond Shamrock is not known to have used this parcel for manufacturing or waste disposal. Uniroyal Chemical Company, Inc., is a "person" as defined by ORC Section 3734.01(G).

kkk. Village of Fairport Harbor, a political subdivision of the State of Ohio, is the current owner of the parcel identified as A-7 on Appendix C. Village of Fairport Harbor previously used the property for a municipal solid waste disposal facility. Respondent Village of Fairport Harbor is a "person" as defined in ORC Section 3734.01(G).

lll. Because of their quantity, concentration, or physical or chemical characteristics, the Director has determined that spent pickle liquor, hexavalent chromium, calcium chloride, ammonia, cadmium, chromium, copper, lead, zinc, nickel, manganese, vanadium, mercury, 4,4'-DDD, 4,4'-DDT, aluminum, arsenic, beryllium, cobalt, iron, phenanthrene, fluoranthrene, pyrene, benzo(a)anthracene, chrysene, 4,4'-DDE, Endrin aldehyde, bis (2-ethylhexyl) phthalate, PCB-1260, Heptachlor epoxide, Di-n butyl phthalate, Dieldrin, and PCB-

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

1254, and other contaminants found at the Site are "hazardous wastes" as defined under Section 3734.01(J) of the Ohio Revised Code.

mmm. The Site is a hazardous waste facility, solid waste facility, or other location where hazardous waste was treated, stored, or disposed.

nnn. Conditions at the Site are causing or contributing or threatening to cause or contribute to air or water pollution or soil contamination.

ooo. Spent pickle liquor, hexavalent chromium, calcium chloride, ammonia, cadmium, chromium, copper, lead, zinc, nickel, manganese, vanadium, mercury, 4,4'-DDD, 4,4'-DDT, aluminum, arsenic, beryllium, cobalt, iron, phenanthrene, fluoranthrene, pyrene, benzo(a)anthracene, chrysene, 4,4'-DDE, Endrin aldehyde, bis (2-ethylhexyl) phthalate, PCB-1260, Heptachlor epoxide, Di-n butyl phthalate, dieldrin, and PCB-1254, and other contaminants found at the Site are "industrial wastes" or "other wastes" as defined under Section 6111.01 of the Ohio Revised Code.

ppp. The ground water and surface water at or within the vicinity of the Site are "waters of the state" as defined under Section 6111.01(H) of the Ohio Revised Code.

qqq. The Work required by these Orders will contribute to the prohibition or abatement of the discharge of industrial wastes or other wastes into the waters of the state.

rrr. In issuing these Orders, the Director has given consideration to, and based his determination on, evidence relating to the technical feasibility and economical reasonableness of complying with these Orders and to evidence relating to conditions calculated to result from compliance with these Orders, and their relation to benefits to the people of the state to be derived from such compliance.

V. GENERAL PROVISIONS

8. Objectives of the Parties

The objective of the Parties in entering into these Orders is to follow a program of sound and feasible scientific, engineering and construction practices to protect public health, safety, and welfare and the environment from

OHIO E.P.A. SEP 27 '95 OFFICE OF DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cason Date 9-27-95

the disposal, discharge, or release of, Hazardous Substances, at the Site through the development and implementation of an RI/FS Work Plan by Respondents consistent with the NCP. These Orders have been negotiated in good faith and the implementation of these Orders will expedite the investigation of the Site and will avoid prolonged and complex litigation over the RI/FS between the State of Ohio and the Respondents.

9. Commitment of Respondents

Without admission of fact, violation or liability, Respondents shall perform the Work in accordance with these Orders, including but not limited to, the SOW, relevant guidance documents identified in accordance with Paragraph 12.b of these Orders, and all standards, specifications, and schedules set forth in or developed pursuant to these Orders consistent with the objectives set forth in Paragraph 8 and the approved Work Plan. Respondents shall also reimburse Ohio EPA for Response Costs as provided in these Orders.

Ohio EPA acknowledges that:

(i) Respondents are early settlors;

(ii) Early settlement is valuable;

(iii) Other parties who received special notice letters and /or general notice letters have not been involved in negotiating these Orders and have failed to participate cooperatively to date;

(iv) Respondents intend to pursue contribution and other legal or equitable remedies from other liable non-settling parties as permitted by State or federal law, and Ohio EPA agrees to provide reasonable assistance to the Respondents in those contribution and other claims.

10. Compliance With Law

a. All activities undertaken by Respondents pursuant to these Orders shall be performed in accordance with the requirements of all applicable federal and state laws and regulations.

b. Respondents shall perform the activities required pursuant to these Orders in a manner which is consistent with the NCP. The Ohio EPA believes

OHIO E.P.A. SEP 27 95 DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

that activities conducted pursuant to these Orders, if approved by the Ohio EPA, are consistent with the NCP.

c. Where any portion of the Work requires a permit or approval, Respondents shall timely submit applications and take all other actions lawfully required to obtain such permits or approval. These Orders are not, and shall not be construed to be, a permit issued pursuant to any statute or regulation.

VI. PERFORMANCE OF THE WORK BY RESPONDENTS

11. Supervising Contractor

All Work performed pursuant to these Orders shall be under the direction and supervision of a supervising contractor with expertise in hazardous waste site investigation and remediation. Prior to the initiation of the Work, Respondents shall notify Ohio EPA in writing of the name of such supervising contractor and any subcontractor then identified to be used in carrying out the terms of these Orders, identifying those who engage in tasks of environmental investigation required by the RI/PS Work Plan, and further identifying any additional contractors or subcontractors engaged as such subsequent to the initial notification.

12. Remedial Investigation and Feasibility Study

a. Within sixty (60) days after the effective date of these Orders, Respondents shall submit to Ohio EPA a work plan for implementation of the Remedial Investigation and Feasibility Study for the Site. The RI/FS Work Plan shall provide for the determination of the nature and extent of the contamination of the Site caused by the disposal, discharge, or release of Hazardous Substances, and for the development and evaluation of remedial alternatives for the cleanup of the Site. All Work to be undertaken by the Respondents under these Orders, including any additional work in accordance with Section VII, Additional Work, or any Interim Action in accordance with Paragraph 12.f, shall be set forth in writing and incorporated into the RI/FS Work Plan.

b. The RI/PS Work Plan shall be developed in conformance with the SOW and the guidance documents listed in Appendix B to these Orders, attached hereto and incorporated herein unless the Parties mutually agree otherwise. If Ohio EPA or the Respondents determine that any additional or revised guidance

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

documents in use by Ohio EPA or U.S. EPA after the effective date of these Orders affect the Work to be performed in implementing the Remedial Investigation and Feasibility Study, the Party discovering the new guidance shall notify the other in writing, and the RI/FS Work Plan and other affected documents shall be modified accordingly. Tasks required under the approved RI/FS Work Plan which have already been materially implemented shall not be required by these Orders to be redone pursuant to any revised or additional guidance documents without the Respondents' consent, which consent shall not be unreasonably withheld. The exception will be guidance documents which materially affect cleanup levels and exist prior to the Ohio EPA issuing the preferred plan.

c. Ohio EPA acknowledges that Respondents and governmental agencies have performed prior investigatory work at the Site, and agrees that Respondents may submit the data so obtained, including quality assurance/quality control information, to Ohio EPA. Ohio EPA agrees to review such data and approve or disapprove the inclusion of such data in the RI/FS.

d. Ohio EPA will review the RI/FS Work Plan pursuant to the procedures set forth in Section XII, Review of Submittals. Upon approval of the RI/FS Work Plan by Ohio EPA, Respondents shall implement the RI/FS Work Plan. Respondents shall submit all plans, reports, or other deliverables required under the approved RI/FS Work Plan, in accordance with the approved schedule, for review and approval pursuant to Section XII, Review of Submittals.

e. Within fourteen (14) days of the effective date of these Orders, Respondents shall meet with the Ohio EPA to discuss the requirements of the RI/FS Work Plan unless otherwise mutually agreed to by the Parties.

f. As of the effective date of these Orders and based on information then known to Ohio EPA, Ohio EPA has determined that no Interim Actions are necessary.

g. This sub paragraph sets forth the exclusive mechanism for requiring an Interim Action. Within thirty (30) days of receipt of written notice from the Ohio EPA that an Interim Action needs to be performed at the Site, Respondents shall indicate in writing their willingness to perform such an Interim Action. If Respondents are willing to perform the Interim Action,

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
DIRECTOR'S JOURNAL

Respondents shall provide a proposed schedule to the Ohio EPA within ten (10) days, which schedule shall be approved by the Ohio EPA, for submitting an Interim Action work plan for the performance of the Interim Action. Upon approval of the Interim Action work plan by the Ohio EPA pursuant to Section XII, Review of Submittals, Respondents shall implement the work plan in accordance with the schedules contained therein. Respondents' obligation to perform such an Interim Action under these Orders shall arise upon Respondents' written notice indicating their willingness to perform the Interim Action. Respondents acknowledge that the conditional nature of the obligation to perform such an Interim Action represents a pilot project undertaken by the Ohio EPA with the knowledge of U.S. EPA as a result of factors specific to this Site. Respondents further acknowledge that this approach does not establish a precedent for future negotiations or enforcement actions undertaken by the Ohio EPA.

h. The provisions of Section XIII, Dispute Resolution, shall apply to Paragraphs 12.b and 12.f.

13. Within ninety (90) days of the effective date of these Orders, Respondents shall submit to the Ohio EPA for review and comment a health and safety plan developed in conformance with the guidance documents listed in Appendix B.

VII. ADDITIONAL WORK

14. Ohio EPA or Respondents may determine that in addition to the tasks defined in the approved RI/FS Work Plan, additional work may be necessary to accomplish the objectives of these Orders as set forth in Paragraph 8 of these Orders and the SOW. Ohio EPA may require additional work based on conditions and/or events at the Site to the extent such conditions or events were not known by Ohio EPA at the date of approval of the Work Plan. If a determination made by Ohio EPA that additional work (other than confirmatory sampling) is necessary is based solely on analytical data, such data shall be validated in accordance with the guidance documents in Appendix B. In the event that Ohio EPA determines that additional work is required based upon validated data with respect to which Respondents have not had the opportunity to observe and to take split and/or duplicate samples, Respondents may perform confirmatory sampling. The provisions

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 1995
DIRECTOR'S JOURNAL

of Section XIII, Dispute Resolution, shall apply to this Section VII, Additional Work.

15. Prior to Ohio EPA's issuance of the written certification of completion provided for in Section XXIV on Termination, Ohio EPA may send Respondents written notice that additional work is necessary to achieve the purpose of these Orders, subject to the preceding paragraph. Ohio EPA's written notice shall include an explanation of why such additional work is necessary. Within ten (10) days of receipt of written notice from Ohio EPA, Respondents shall submit a schedule for submittal of an amendment to the RI/FS Work Plan for the performance of the additional work. The amendment to the RI/FS Work Plan shall conform to the standards and requirements set forth in Paragraph 8 and Paragraph 12.b. of these Orders. Upon approval of the amendment to the RI/FS Work Plan by Ohio EPA pursuant to Section XII, Review of Submittals, Respondents shall implement such amendment in accordance with the standards, specifications and schedules contained therein. Without waiving any other provision of these Orders, in the event there is a delay in the time schedules set forth in the RI/FS Work Plan, subsequent schedules may be adjusted accordingly upon agreement of the Parties. Such agreement shall not be unreasonably withheld by Ohio EPA, and such delay shall not be considered a violation of these Orders.

16. In the event that Respondents determine that additional work is necessary to fulfill these Orders, Respondents shall notify Ohio EPA. Ohio EPA may then, at its discretion, take action triggering the obligations of Ohio EPA and Respondents in accordance with this Section.

VIII. SAMPLING AND DATA AVAILABILITY

17. Respondents shall notify Ohio EPA not less than fifteen (15) days in advance of all sample collection activity required by the Work Plan (unless the Site Coordinators mutually agree on a shorter period of time). Upon request, Respondents shall allow split and/or duplicate samples to be taken by Ohio EPA of any samples required by the Work Plan. Ohio EPA shall also have the right to take any additional samples it deems necessary. Upon request, Ohio EPA shall allow Respondents to take split and/or duplicate samples of any samples Ohio EPA takes as part of its oversight of Respondents' implementation of the Work.

OHIO E.P.A. SEP 27 95 RECEIVED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

Respondents shall also have the right to take any additional samples they deem necessary. Any such sampling will comply with the requirements of ORC Section 3734.02(H) and OAC 3745-27-13, if applicable. Nothing in this Section shall limit the rights of the Ohio EPA under ORC Chapters 6111 or 3734 nor the rights of any Respondent with respect to Ohio EPA's exercise of any rights under ORC Chapters 6111 or 3734.

18. All raw data generated by or on behalf of Respondents and required by the Work Plan shall be available for inspection by Ohio EPA at Respondents'. designated address under Section XI, Progress Reports and Notice. Within seven (7) days of receipt of a request by Ohio EPA, Respondents shall submit to Ohio EPA copies of the results of all sampling and/or tests or other data, including validated raw data and original laboratory reports, generated by or on behalf of Respondents with respect to the Site and/or the implementation of these Orders. Respondents may submit to Ohio EPA any interpretive reports and written explanations concerning the raw data and original laboratory reports. Such interpretive reports and written explanations shall not be submitted in lieu of original laboratory reports and raw data. No amendments to the Work Plan shall be required by Ohio EPA solely on the basis of unvalidated raw data. Should Respondents subsequently discover an error in any report or raw data, Respondents shall promptly notify Ohio EPA of such discovery and provide the correct information.

IX. ACCESS

19. Ohio EPA shall have access to the Site and any other property to which access is required for the implementation of these Orders, to the extent access to the property is controlled by Respondents. Access under these Orders shall be for the purpose of conducting any activity related to these Orders including, but not limited to the following:

a. Monitoring the Work;

b. Conducting sampling;

c. Inspecting and copying records, operating logs, contracts, and/or other documents related to the implementation of these Orders;

d. Conducting investigations and tests related to the

OHIO E.P.A. SEP 27 95 DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

implementation of these Orders; and

e. Verifying any data and/or other public information submitted to Ohio EPA.

20. To the extent that any portion of the Site or any other property to which access is required for the implementation of these Orders is owned or controlled by persons other than Respondents, Respondents shall use reasonable best efforts to secure from such persons access for Respondents and the Ohio EPA as necessary to effectuate these Orders. Copies of all access agreements obtained by Respondents shall be provided promptly to Ohio EPA. If any access required to effectuate these Orders is not obtained within thirty (30) days of the effective date of these Orders, or within thirty (30) days of the date Ohio EPA notifies Respondents in writing that additional access beyond that previously secured is necessary, Respondents shall promptly notify the Ohio EPA of the steps Respondents have taken to attempt to obtain access. Upon the request of Ohio EPA, Respondents shall promptly submit in writing a summary of their efforts to obtain access. Ohio EPA may, as it deems appropriate, assist Respondents in obtaining access. Failure by Respondents to gain access despite the exercise of all reasonable best efforts, and any delay resulting therefrom, will not be considered a violation of these Orders.

21. Notwithstanding any provision of these Orders, the State of Ohio retains all of its access rights and authorities, including enforcement authorities related thereto, under any applicable statute or rule. The provisions of Section XIII, Dispute Resolution, shall apply to this Section.

X. DESIGNATED SITE COORDINATORS

22. Within fourteen (14) days of the effective date of these Orders, Respondents shall notify Ohio EPA, in writing, of the name, address and telephone number of their designated Site Coordinator and Alternate Site Coordinator. Within fourteen (14) days of the effective date of these Orders, Ohio EPA shall notify Respondents of the name, address and telephone number of its designated Site Coordinator. Ohio EPA and Respondents reserve the right to change their respective Site Coordinator or Alternate Site Coordinator. Such a change shall be accomplished by notifying the other Party in writing prior to the change,

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

unless impracticable.

23. To the maximum extent practicable, except as specifically provided in these Orders, communications between Respondents and Ohio EPA concerning the implementation of these Orders shall be made between the Site Coordinators. Any dispute arising out of these Orders may be addressed informally by the Parties' Site Coordinators (together with each Party's technical personnel, consultants or contractors as may be necessary) until such time as one Party invokes a formal dispute pursuant to Section XIII, Dispute Resolution. Respondents' Site Coordinator shall be reasonably available for communication with Ohio EPA, and Ohio EPA's Site Coordinator shall be reasonably available for communication with Respondents regarding the implementation of these Orders for the duration of these Orders. Each Site Coordinator shall be responsible for assuring that all communications from the other side are appropriately disseminated and processed. In order to facilitate the exchange of information regarding the Site, the Site Coordinators shall meet in person monthly, unless mutually agreed otherwise. Respondents' Site Coordinator or designated Alternate Site Coordinator shall be present on the Site or on call during all hours of Work at the Site.

24. Without limitation of any authority conferred on Ohio EPA by statute or regulation, the Ohio EPA Site Coordinator's authority includes, but is not limited to, the exercise of authority granted by other sections of these Orders in accordance with the applicable provisions of those sections, including the following:

a. Taking samples and directing, pursuant to an approved Work Plan, the type, quantity and location of samples to be taken by Respondents;

b. Observing, taking photographs, or otherwise recording information related to the implementation of these Orders, including the use of any mechanical or photographic device;

c. Directing that specific Work activities stop for a period not to exceed seventy-two (72) hours whenever the Site Coordinator for Ohio EPA determines that those activities at the Site may create or exacerbate a threat to public health or safety, or threaten to cause or contribute to air or water pollution or soil contamination, with an equal extension to the schedule for any

OHIO E.P.A.
SEP 27 95
DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

Work or submittals directly affected by the Work stoppage;

d. Conducting investigations and tests related to the implementation of these Orders;

e. Inspecting and copying records, operating logs, contracts and/or other documents related to the implementation of these Orders in accordance with the requirements of these Orders on document availability; and

f. Assessing for Ohio EPA Respondents' compliance with these Orders.

XI. PROGRESS REPORTS AND NOTICE

25. Unless otherwise directed by Ohio EPA, Respondents shall submit a written progress report to the Ohio EPA by the tenth (10) day of every month except upon mutual agreement of the Site Coordinators during periods of little activity, when progress reports may be submitted quarterly. At a minimum, the progress reports shall:

a. Describe the status of the Work and actions taken toward achieving compliance with the Orders during the reporting period;

b. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties;

c. Describe activities planned for the next month;

d. Identify changes in key personnel;

e. List target and actual completion dates for each element of activity, including project completion;

f. Provide an explanation for any deviation from any applicable schedules; and

g. Indicate how much contaminated soil was removed and contaminated ground water was pumped and indicate where such contaminated media were disposed of.

26. Progress reports and all other documents required to be submitted pursuant to these Orders shall be sent by certified mail return receipt requested, or equivalent or facsimile transmission with original sent by regular mail, or hand delivery, to the following addresses:

Ohio Environmental Protection Agency
1800 WaterMark Drive
P.O. Box 1049

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

Columbus, Ohio 43216-1049
ATTN: Manager, TPSS, DERR
Facsimile: 614/644-3146

Ohio EPA
Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087
ATTN: Site Coordinator, Diamond Shamrock Site, DERR
Facsimile: 216/487-0769

All correspondence to Respondents shall be directed to the following address:

Physical Address
Painesville PRP Group
C/o Chemical Land Holdings, Inc.
Midland Building, Suite 207
10 West Erie Street
Painesville, Ohio 44077
ATTN: Diamond Shamrock Site Coordinator
Facsimile: 216/350-9904
Telephone: 216/350-9901

Mailing Address
Painesville PRP Group
P. O. Box 0188
Painesville Ohio, 44077
ATTN: Diamond Shamrock Site Coordinator

With copies to:

Maxus Energy Corporation
717 North Harwood Street
Dallas, Texas 75201
Attention: General Manager, Environmental Affairs

OHIO E.P.A.
SEP 27 95
DIRECTOR'S JOURNAL

XII. REVIEW OF SUBMITTALS

27. Ohio EPA shall review any work plan, report, or other item required to be submitted pursuant to these Orders. The review and approval by Ohio EPA of all submittals required by this Consent Order will include an examination for consistency with the NCP. When any task to be performed pursuant to these Orders is contingent on prior Ohio EPA review and decision, the time for beginning and completing the subsequent task shall be calculated from the completion of Ohio EPA review and decision. Ohio EPA will attempt to review documents on an expedited basis as necessary to avoid delay in the implementation of any measures that may be required in accordance with the Work Plan. In the event modifications or additions to submittals requested by Ohio EPA delay the time schedules set forth in the Work Plan, the schedules may be adjusted accordingly upon agreement of the Parties; such agreement shall not be unreasonably withheld by Ohio EPA, and such delay shall not be considered a violation of these Orders.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

All periods of time for action, decisions, submittals and notices by Respondents and by Ohio EPA shall begin upon receipt of the document which triggers the time period. Whenever a period of time begins upon an exchange of documents, the period begins when the later of the two documents is received. All actions, decisions, submittals and notices by Respondent and by Ohio EPA in connection with these Orders shall be made within a reasonable time, and the Site Coordinators shall notify each other of expected time periods for such actions, decisions, submittals and notices whenever a particular time period is not specified in these Orders or the Work Plan. Upon review and in writing, Ohio EPA may: (a) approve the submission in whole or in part; (b) approve the submission upon specified conditions; (c) require Respondents to modify the submission; (d) disapprove the submission in whole or in part, notifying Respondents of deficiencies; or (e) any combination of the above. In the event Respondents are notified by Ohio EPA that the submission is approved upon conditions or disapproved in whole or in part, or that modifications are required, Ohio EPA shall include a statement in the written notification that it is made pursuant to this paragraph and provide a specification of the deficiencies and an explanation as to why such modifications or additions are necessary (including the technical basis where applicable).

28. In the event of approval or approval upon condition, Respondents shall proceed to take any action required by the submission as approved or conditionally approved by Ohio EPA.

29. In the event that Ohio EPA notifies Respondents of any deficiencies or required modifications, Respondents shall within thirty (30) days of receipt of Ohio EPA's written notice of deficiency (i) remedy the deficiencies specified and submit a revised submission to Ohio EPA for approval or, (ii) to the extent that Respondents contest the existence of any deficiencies including any conditions, requested modifications, changes, additions, and/or deletions specified by the Ohio EPA, Respondents shall initiate the procedures for dispute resolution set forth in Section XIII, Dispute Resolution. If the deficiencies require more than thirty (30) days for the Respondents to respond, the Respondents shall, within fifteen (15) days of receipt of Ohio EPA's notice of

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

deficiency, notify Ohio EPA in writing of a reasonable new due date for completion of their response. Ohio EPA shall not unreasonably withhold approval of Respondents' proposed new due date. Respondents' revised submission shall incorporate all of the uncontested conditions, requested modifications, changes, additions, and/or deletions specified by Ohio EPA in its notice of deficiency. Notwithstanding the notice of deficiency, Respondents shall proceed to take any action required by the portion of the submission not affected by Ohio EPA's notice of deficiency.

30. In the event that Ohio EPA disapproves in whole or in part and notifies Respondents of any deficiencies or required modifications following a revised submission, Respondents shall within fourteen (14) days (i) remedy the deficiencies specified and/or incorporate all changes, additions, and/or deletions and submit a revised submission to Ohio EPA, or (ii) to the extent that Respondents contest the existence of any deficiencies and any changes, additions, and/or deletions specified by the Ohio EPA, initiate the procedures for dispute resolution set forth in Section XIII, Dispute Resolution. Respondent shall not initiate Dispute Resolution for a matter which (i) was previously the subject of Dispute Resolution, or (ii) the opportunity to dispute was previously available and where Respondents made no effort to remedy the deficiencies specified by Ohio EPA in the revised submission. Ohio EPA shall not claim as a deficiency any matter previously made the subject of Dispute Resolution to the extent the revised submission reflects the actual resolution of the dispute. If the deficiencies require more than fourteen (14) days for Respondents to respond, the Respondents shall, within seven (7) days of receipt of the notice of deficiency, notify Ohio EPA in writing of a reasonable new date for the completion of the response. Ohio EPA shall not unreasonably withhold approval of Respondents' proposed new due date. Instead of requiring Respondents to cure deficiencies following disapproval of a revised submission, Ohio EPA retains the right to modify the revised submission (provided that such modifications are clearly identified as authored by Ohio EPA, and Respondents may apply the provisions of Section XIII, Dispute Resolution, to such modifications if not previously disputed), terminate these Orders, perform any additional remediation,

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cain Date 9-27-95

OHIO E.P.A.
SEP 27 95
DIRECTOR'S JOURNAL

conduct a complete or partial Remedial Investigation and Feasibility Study, and/or enforce the terms of these Orders.

31. All work plans, reports, or other items required to be submitted to Ohio EPA under these Orders shall, upon approval by Ohio EPA, be deemed to be incorporated in and made an enforceable part of these Orders. In the event that Ohio EPA approves a portion of a work plan, report, or other item, the approved portion shall be deemed to be incorporated in and made an enforceable part of these Orders. Delays in performance of Work covered by these Orders due to the time taken for government review shall not be considered a violation of these Orders or counted toward the running of time limits under these Orders.

XIII. DISPUTE RESOLUTION

32. The Site Coordinators shall, whenever possible, operate by consensus. In the event that there is a dispute about the adequacy of any work plan, report, or other item required to be submitted pursuant to these Orders, the Site Coordinators shall have seven (7) days from the date the dispute arises to reduce their positions to writing. The dispute shall be considered to have arisen when one Party notifies the other Party in writing that it is invoking the dispute resolution procedures of this Section. The written positions of the Site Coordinators shall include the technical rationale supporting the Party's position and shall be immediately exchanged by the Site Coordinators. This seven (7) day period for the exchange of written positions may be extended by mutual agreement of the Parties. Such agreement shall not be unreasonably withheld.

33. Following the exchange of written positions, the Site Coordinators shall have an additional seven (7) days to resolve the dispute. Ohio EPA and Respondents shall have the right to select additional personnel to participate in resolution of the dispute on their own behalf. If Ohio EPA concurs with the position of Respondents, then the Work Plan, report, or other item required to be submitted pursuant to these Orders shall be modified accordingly. If a dispute still exists on an issue involving the approval of the Work Plan, an Interim Action required by Ohio EPA to be performed by Respondents under these Orders, or amendment to the Work Plan (including additional work) totalling over $175,000.00 required by Ohio EPA to be performed by Respondents under these

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
RECEIVED DIRECTOR'S JOURNAL

Orders, the Respondents, by notifying the Ohio EPA in writing within five (5) days after the last dispute resolution meeting under this Paragraph, may invoke the provisions of Section XIV, Mediation. The availability of Mediation is limited to disputes as described in this paragraph, and Respondents may invoke Mediation once only for issues regarding approval of the Work Plan, and once only for each required Interim Action or incidence of additional work valued over $175,000.00. In order to invoke Mediation over the requirement for additional work, Respondents must submit proof of the cost of such work along with their request for Mediation; acceptance of such proof is at Ohio EPA's discretion, which acceptance shall not be unreasonably withheld, and Ohio EPA may require the submittal of additional information before Mediation proceeds.

34. If Ohio EPA does not concur with Respondents, the Ohio EPA Site Coordinator shall notify the Respondents of Ohio EPA's position in writing. Ohio EPA's position shall be based upon and consistent with these Orders, the SOW, and other federal and state laws and regulations. Within seven (7) days of receipt of such notice from Ohio EPA, Respondent may forward a written statement and request for a meeting to the Chief of the Division of Emergency and Remedial Response ("DERR") or his/her designee to resolve the dispute. The designee if needed shall be an Assistant Chief of DERR. If the Respondents do not forward a written statement requesting a meeting within seven (7) days of receipt of Ohio EPA's position, the dispute shall be deemed resolved by Ohio EPA pursuant to the Ohio EPA's written position. If the Respondents request a meeting with the Chief of DERR, then such a meeting shall be held between the Parties as soon as practicable. The meeting shall be limited to concise presentations of their positions by each Party, first by the Respondents followed by the district office staff. The chief or his/her designee shall be free to ask questions or solicit input from either Party. The Chief of DERR shall issue a resolution of the dispute in writing based upon and consistent with these Orders, the SOW, and other appropriate federal and state laws and regulations within seven (7) days of the requested meeting. The pendency of a dispute under this Section shall not affect the time period for completion of the Work, except that upon mutual agreement of the Parties, any time period may be extended as appropriate under

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
DIRECTOR'S JOURNAL

the circumstances. Such agreement shall not be unreasonably withheld by Ohio EPA. Elements of the Work not affected by the dispute shall be completed in accordance with applicable schedules and timeframes. The opportunity to invoke dispute resolution under this Section shall not be available to Respondents unless otherwise expressly stated with respect to an individual provision of these Orders.

XIV. MEDIATION

36. The Parties agree to be bound by the provisions of this Section and to cooperate with one another to effectuate the purposes of the Mediation. This Mediation is for the exclusive benefit of the Parties to effectuate the purposes stated herein and shall not be deemed to give or imply any legal or equitable right, interest, remedy, benefit or claim to any other entity or person. The Mediation shall not be binding and shall not impede Ohio EPA's authority to enforce these Orders or exercise any other legal authority. The Parties may modify the procedures of this Section by mutual written agreement.

37. The purposes of the Mediation are as follows:

a. to provide a formal, voluntary and non-binding mechanism involving the services of an independent third-party neutral person to expedite free discussion of the issues set forth herein;

b. to freely discuss, without prejudice, any issues related to the approval of the Work Plan, an Interim Action required by Ohio EPA to be performed by Respondents under these Orders, or amendments to the Work Plan (including additional work) totalling over $175,000.00 required by Ohio EPA to be performed by Respondents under these Orders; and

c. to freely exchange ideas relative to the issues subject to mediation.

38. Within forty-five (45) days of the journalization date of these Orders, Respondents shall provide a list of no fewer than six (6) Mediator candidates to the Ohio EPA, along with resumes, background material, curricula vitae and/or other appropriate information relevant to a Mediator's qualifications as described in this Section. The Mediator candidates shall have experience and/or education relevant to RI/FS-type work. Upon written

OHIO E.P.A. SEP 27 '95 JOHN D. DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

notification from Ohio EPA that one or more of the Mediator candidates has been rejected, prior to the occurrence of any dispute in which Mediation is invoked Ohio EPA may request Respondents to provide additional names of Mediator candidates equal to the number rejected but no more than six (6), and Respondents shall comply with any such request from Ohio EPA within a reasonable period of time not to exceed forty-five (45) days. Respondents may propose a longer period of time if more than one Mediator candidate is involved and Ohio EPA approval will not be unreasonable withheld. In addition, prior to the occurrence of any dispute in which Mediation is invoked, Respondents may propose up to six (6) additional names of Mediator candidates. In the event that the provisions of this Section are invoked by Respondents, the Ohio EPA shall select the Mediator from the list of candidates provided by Respondents, in accordance with Paragraph 41.a., below. The Mediator shall be an independent and impartial individual, experienced in mediation techniques and preferably knowledgeable in the subject matter of the dispute, who shall perform the functions stated as follows in this Section and incidental actions necessary for carrying out these functions:

a. Working with the Parties to establish reasonable procedures necessary to carry out the purposes of this Section, including successfully meeting established deadlines.

b. Gathering and/or disseminating information from the Parties as needed to clarify issues raised during the process of mediation.

c. Meeting with any or all of the Parties or their counsel, or their experts in joint or individual meetings as he or she deems appropriate in order to further mutual understanding of the issues.

d. Facilitating discussions among the Parties in a manner which encourages open and productive sharing of ideas.

e. Taking appropriate measures to discourage counterproductive behaviors such as positioning or posturing.

f. Preparing written meeting agendas and summary notes, upon mutual request of the Parties.

The Mediator may retain an assistant as required to facilitate the Mediation.

39. The Parties and the candidates for Mediator shall immediately

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

disclose to each other any circumstances which may cause justifiable doubt as to the independence or impartiality of any individual or firm under consideration. Following the selection, the Parties and the Mediator shall have a continuing duty to disclose to each other immediately any circumstances which may cause justifiable doubt as to the independence or impartiality of the selected Mediator. These same conflict of interest rules shall apply to any assistant retained by the Mediator for this Mediation.

40. Upon selection of the Mediator by Ohio EPA, the Respondents shall enter into a contract which outlines the agreements between the Parties and the Mediator as to fees, schedules, duties, and payments. The Mediation contract shall reflect that Respondents shall bear responsibility for payment of all Mediation costs, except that each Party, except the Ohio EPA, shall bear the costs of their own attorney fees related to the Mediation. The participation of the Ohio EPA and any contractors hired by Ohio EPA in the Mediation is a Response Cost or Oversight Cost which Respondents shall pay to the State as required by Section XVI of these Orders. The costs of Ohio EPA shall be submitted to Respondents and paid by Respondents as set forth in Section XVI. The Mediator shall not be liable for any act or omission in connection with his or her role in the Mediation process.

41. The selection of the Mediator by the Ohio EPA and the Mediation shall be conducted in accordance with the following schedule:

a. Within fifteen (15) days after the date Ohio EPA receives notice from Respondents invoking the provisions of this Section, Ohio EPA shall select a Mediator from the list provided by Respondents and will notify Respondents of the selection in writing.

b. Within thirty (30) days of the date Ohio EPA notifies the Respondents of the name of the Mediator, Respondents will act, as necessary, to obtain the services of the selected Mediator through a Mediation Contract as described in Paragraph 40, above. This time period may be extended upon mutual agreement of the Parties. In the event that Ohio EPA's selection for Mediator is not available, Ohio EPA will select an alternate and Respondents shall have an additional thirty (30) days to obtain the Mediator's services.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
DIRECTOR'S JOURNAL

c. The Parties shall have forty-five (45) days from the time the Mediation Contract is entered to resolve the dispute through Mediation. This time period may be extended upon mutual agreement of the Parties. During this time period, documents may be exchanged by the Parties indicating issues upon which consensus has been reached.

42. Upon completion of the Mediation, the Ohio EPA will issue a written document summarizing any consensus reached through the Mediation and resolving the dispute.

43. Mediation sessions will be held in Columbus, Ohio unless otherwise agreed by all Parties.

XV. UNAVOIDABLE DELAYS

44. Respondents shall cause all Work to be performed in accordance with applicable schedules and timeframes unless any such performance is prevented or delayed by an event which constitutes an unavoidable delay. For purposes of these Orders, an "unavoidable delay" shall mean an event beyond the control of Respondents which prevents or delays performance of any obligation required by these Orders and which could not be overcome by due diligence on the part of Respondents. Increased cost of compliance shall not be considered an event beyond the control of Respondents.

45. Respondents shall notify Ohio EPA in writing within fifteen (15) days after Respondents' Site Coordinator or Alternate Site Coordinator have knowledge of the occurrence of an event which Respondents contend is an unavoidable delay. Such written notification shall describe the anticipated length of the delay, the cause or causes of the delay, the measures taken and to be taken by Respondents to minimize the delay, and the timetable under which these measures will be implemented. Respondents shall have the burden of demonstrating that the event constitutes an unavoidable delay.

46. If Ohio EPA does not agree that the delay is an unavoidable delay, Ohio EPA will notify the Respondents in writing. In the event that the delay is not an unavoidable delay, Ohio EPA and Respondents reserve all rights to take any action as described in Section XVII, Reserva[illegible] Rights and Contribution Protection. If Ohio EPA agrees that the delay is an unavoidable delay, Ohio EPA

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

will notify Respondents in writing of a reasonable extension of time for the performance of the obligations affected by the unavoidable delay. If the extension of time granted is less than the period of the delay itself, Ohio EPA shall explain in writing why the shorter period of time granted is reasonable. The provisions of Section XIII, Dispute Resolution, shall apply to this Section.

XVI. REIMBURSEMENT OF COSTS

47. Ohio EPA has incurred and continues to incur Response Costs in connection with the Site. Respondents shall reimburse Ohio EPA for all Ohio EPA's Response Costs incurred prior to December 31, 1994, which total $64,051.12.

48. Within forty-five (45) days of the effective date of these Orders, Respondents shall remit a check to the Ohio EPA for the full amount claimed for Response Costs incurred prior to December 31, 1994.

49. With respect to Response Costs incurred after December 31, 1994, Ohio EPA will annually submit to Respondents an itemized statement of its Response Costs for the previous calendar year, including but not limited to, identification of employees and agents, including contractors and subcontractors, and an explanation of the tasks performed and the basis upon which such costs are claimed. Within forty-five (45) days of receipt of such itemized statement, Respondents shall remit payment for all of Ohio EPA's Response Costs for the previous year. Should Respondents contest the accuracy of the Response Costs set forth in an itemized statement, or require additional support for such costs, Respondents may invoke the procedures of Section XIII, Dispute Resolution, within thirty (30) days of receiving the itemized statement. Any Response Costs which the Respondents must pay as a result of dispute resolution shall be paid within thirty (30) days of the resolution of the dispute. In any calendar year, Respondents may request, but not more frequently than quarterly, an estimate of Ohio EPA Response Costs incurred to that date, and Ohio EPA shall provide such estimate, which in no way shall limit any later comprehensive statement of costs for that calendar year.

50. Respondents shall remit payments to Ohio EPA pursuant to this Section as follows:

a. Payment shall be made by certified check payable to "Treasurer,

OHIO E.P.A.
SEP 27 95
CERTIFIED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

State of Ohio" and shall be forwarded to Fiscal Officer, Ohio EPA, P.O. Box 1049, 1800 WaterMark Drive, Columbus, Ohio 43216-1049, ATTN: Edith Long or her successor.

b. A copy of the transmittal letter and check shall be sent to the Fiscal Officer, DERR, Ohio EPA, P.O. Box 1049, 1800 WaterMark Drive, Columbus, Ohio 43216-1049.

XVII. RESERVATION OF RIGHTS AND CONTRIBUTION PROTECTION

51. Ohio EPA reserves the right to seek legal and/or equitable relief to enforce the terms and conditions of these Orders, including penalties against Respondents for noncompliance with these Orders. Except as expressly provided herein to the contrary, Respondents reserve any rights they may have to raise any legal or equitable defense in any action brought by Ohio EPA to enforce the terms and conditions of these Orders.

52. Ohio EPA reserves the right to terminate these Orders and/or perform all or any portion of the Work or any other measures in the event that the requirements of these Orders are not wholly complied with within the timeframes required by these Orders.

53. Subject to Section XXIII, Agreement not to Refer, Ohio EPA reserves the right to take any action, including but not limited to any enforcement action, action to recover costs, or action to recover damages for injury to natural resources, pursuant to any available legal authority as a result of past, present, or future violations of state or federal laws or regulations or the common law, and/or as a result of events or conditions arising from, or related to, the Site. Upon termination of these Orders pursuant to Section XXIV, Termination, Respondents shall have resolved their liability to Ohio EPA only for the Work performed pursuant to these Orders.

54. Notwithstanding and other provision of these Orders, Ohio EPA reserves the right to:

(i) issue requests for information to any person potentially responsible who is not a party to this Order, or who is not a beneficiary of contribution protection under this Order ("Non-Settlor") in accordance with CERCLA Section 104(e), the Cooperative Agreement, and/or State law;

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cason Date 9-27-95

OHIO E.P.A.
SEP 27 95
DIRECTOR'S JOURNAL

(ii) issue notices of potential liability to Non-Settlors;

(iii) secure participation of Non-Settlors by appropriate methods in cooperation with Respondents;

(iv) issue unilateral administrative orders to Non-Settlors to perform work at the Site, whether or not such work is contemplated by the approved Work Plan but ensuring such work does not interfere with efforts of the Respondents;

(v) refer Non-Settlors to the Ohio Attorney General, U.S. EPA or United States Attorney General's office for judicial enforcement;

(vi) seek any other Response Costs from Non-Settlors; and

(vii) take any action against Non-Settlors, including but not limited to any enforcement action, action to recover costs or action to recover damages for injury to natural resources, pursuant to any available legal authority as a result of past, present or future violations of State or federal laws or regulations or the common law, and/or as a result of events or conditions arising from or related to the Site.

55. Notwithstanding (i) the provisions of Paragraph B of the Waiver and Agreement, which waive the Respondents' rights to seek judicial review of these Orders either in law or in equity, and, (ii) any other provisions of these Orders, Respondents reserve the right to challenge Ohio EPA's interpretation of this Consent Order in any action brought by Ohio EPA to enforce the terms and conditions of these Orders. In the event (i) Ohio EPA performs all or any portion of the Work without seeking enforcement against Respondents, and (ii) Ohio EPA seeks reimbursement for such Response Costs, Respondents reserve the right to defend any action brought by Ohio EPA to recover such Response Costs raising the same right to challenge Ohio EPA's interpretation of this Order which Respondents could have raised if Ohio EPA had brought an enforcement action to require Respondents to perform such work.

56. Respondents reserve all rights, claims, demands, and causes of action they have or may have against any and all other persons and entities not parties to these Orders (including any right to contribution or indemnity possessed by Respondents against other parties who may be responsible for actual or threatened

OHIO E.P.A. SEP 27 95 DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

releases at the Site).

57. To the extent provided by CERCLA and/or applicable state law, and to the extent of compliance with these Orders, during performance of these Orders and upon termination and satisfaction of these Orders, Respondents, including individual members of Respondent Painesville PRP Group, shall be afforded the protection against all claims whatsoever for contribution as described by CERCLA and/or applicable state law for the matters addressed by these Orders. For so long as Respondents are in compliance with the terms of these Orders, Ohio EPA shall not (i) grant contribution protection to other parties for the work performed by the Respondents under these Orders, and (ii) shall not enter into a separate Consent Order with parties other than Respondents that otherwise constitutes a release, covenant not to sue, or other settlement whatsoever of such person(s)' liabilities for the work Respondents performed under these Orders.

58. The Respondents' reservation of rights in this Section XVII covers legal and/or equitable rights, whether or not such rights would be denominated as a defense.

OHIO E.P.A. SEP 27 95 DIRECTOR'S JOURNAL

XVIII. ACCESS TO INFORMATION

59. Respondents shall provide to Ohio EPA, upon request, copies of all documents and information within their possession or control or that of its contractors or agents relating to events or conditions at the Site relevant to the contamination at the Site, including, but not limited to manifests, reports, correspondence, or other documents or information related to the Work.

60. Respondents may assert a claim that documents or other information submitted to the Ohio EPA pursuant to these Orders is confidential under the provisions of OAC 3745-50-30(A) or R.C. 6111.05(A). If no such claim of confidentiality accompanies the documents or other information when it is submitted to the Ohio EPA, it may be made available to the public without notice to Respondents.

61. Respondents may assert that certain documents or other information are privileged under the attorney-client or any other privilege recognized by state law. If Respondents make such an assertion, they shall provide the Ohio EPA with

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

the following: (1) the title of the document or information; (2) the date of the document or information; (3) the name and title of the author of the document or information; (4) the name and title of each addressee and recipient; (5) a general description of the contents of the document or information; and (6) the privilege being asserted by Respondents. To the extent that Respondents refuse to provide this information to the Ohio EPA on the basis that doing so would in effect waive the privilege being asserted, Respondents shall, at a minimum, inform the Ohio EPA of the existence of any document being withheld and shall inform the Ohio EPA of the privilege being asserted for the document.

62. No claim of confidentiality shall be made with respect to any data, including but not limited to, all sampling, analytical, monitoring, or laboratory or, to the extent required to be submitted by Ohio EPA under these Orders, interpretive reports relevant to contamination at the Site.

63. Respondents shall preserve for the duration of these Orders and for a minimum of five (5) years after their termination, one complete set of all documents and other information within their possession or control, or within the possession or control of their contractors or agents, which are not privileged and which in any material way relate to the Work notwithstanding any document retention policy to the contrary. Respondents may preserve such documents by microfiche, or other electronic or photographic device. At the conclusion of this document retention period, Respondents shall notify Ohio EPA at least sixty (60) days prior to the destruction of these documents or other information; and upon request, shall deliver such documents and other information to Ohio EPA.

64. To the extent not prohibited by statute or regulation, upon request by the Respondents, Ohio EPA shall reasonably provide Respondents access to public documents that relate to the Site or to the Work to be performed under these Orders, including but not limited to any data or other information submitted to Ohio EPA by persons other than Respondents.

XIX. INDEMNITY

65. Respondents agree to indemnify, save, and hold harmless Ohio EPA from any and all claims or causes of action arising from, or related to, events or conditions at the Site. Ohio EPA agrees to provide notice to Respondents within

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

thirty (30) days of receipt of any claim which may be the subject of indemnity as provided in this Section, and to cooperate with Respondents in the defense of any such claim or action against the Ohio EPA. Ohio EPA shall not be considered a party to and shall not be held liable under any contract entered into by Respondents in carrying out the activities pursuant to these Orders. Consistent with federal, state and common law, nothing in these Orders shall render Respondents liable to indemnify the State of Ohio for any negligent act or omission of the State of Ohio occurring outside of the State of Ohio's exercise of its discretionary functions. Discretionary functions of the State of Ohio include, but are not limited to, the State of Ohio's review, approval or disapproval of Work performed pursuant to these Orders. Respondents and the State of Ohio will cooperate in the defense of any claim or action against the State of Ohio which may be subject of this indemnity.

OHIO E.P.A. SEP 27 '95 LEGAL DIRECTOR'S JOURNAL

XX. OTHER CLAIMS

66. Nothing in these Orders shall constitute or be construed as a release from any claim, cause of action, or demand in law or equity against any person, firm, partnership, or corporation, not subject to these Orders for any liability arising from, or related to, events or conditions at the Site.

XXI. LAND USE AND CONVEYANCE OF TITLE

67. Each Respondent, including for the purposes of this Section individual members of the Respondent Painesville PRP Group, shall use all reasonable efforts to record with the County Recorder's Office for Lake County, Ohio a notice in the deed records with respect to property which is owned by that Respondent and which is known to be part of the Site, at least thirty (30) days prior to any conveyance of any interest in such real property. For the purposes of this paragraph, the geographic boundaries of the Site will be determined as of the time of recording and any Respondent evaluating recording may ask Ohio EPA whether the Respondent's property is then part of the Site. The notice shall reference the existence of these Orders and shall describe any monitoring or containment devices present on the property.

68. Respondents shall use all reasonable efforts to assure that no portion of the Site will be used in any manner which would adversely affect the integrity

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

of any known containment or monitoring systems at the Site. To the extent that a Respondent owns or controls real property which is known to comprise the Site, that Respondent shall notify the Ohio EPA by registered mail at least thirty (30) days in advance of any conveyance of any interest in such real property with any known containment or monitoring systems consistent with its obligations under other applicable laws, including securities laws and regulations. Respondents' notice shall include the name and address of the grantee and a description of the provisions made for continued maintenance of any known containment and monitoring systems. In no event shall the conveyance of any interest in the property that includes, or is a portion of, the Site, release or otherwise affect the liability of Respondents to comply with these Orders.

XXII. EFFECTIVE DATE AND SUBSEQUENT MODIFICATION

69. The effective date of these Orders shall be the date on which it is entered in the Journal of the Director of the Ohio EPA.

70. These Orders may be modified by mutual agreement of the Parties. Modifications shall be in writing and shall be effective on the date entered in the Journal of the Director of the Ohio EPA.

OHIO E.P.A. SEP 27 9 DIRECTOR'S JOURNAL

XXIII. AGREEMENT NOT TO REFER

71. Upon termination of these Orders pursuant to Section XXIV, the Ohio EPA agrees not to refer Respondents for enforcement to the Ohio Attorney General's Office, U.S. EPA, or the United States Attorney General's Office, or take administrative enforcement action against Respondents, for the Work required under these Orders. During the implementation of these Orders, and provided Respondents are in compliance with these Orders, the Ohio EPA agrees not to refer Respondents for enforcement to the Ohio Attorney General's Office, U.S. EPA, or the United States Attorney General's Office, or take administrative enforcement action against Respondents, for the Work required under these Orders.

XXIV. TERMINATION

72. These Orders shall terminate upon Ohio EPA's approval in writing of Respondents' written certification to the Ohio EPA that all Work required to be performed under these Orders, including the payment of Response Costs, has been completed. In the event Ohio EPA dose not approve in writing Respondents'

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

written certification, Respondents may invoke the provisions of Section XIII, Dispute Resolution. The termination of these Orders pursuant to this Section shall not affect the terms and conditions of Section XVII Reservation of Rights and Contribution Protection, Section XVIII Access to Information, Section XIX Indemnity, Section XX Other Claims, Section XXI Land Use and Conveyance of Title and Section XXIII Agreement Not To Refer. Respondents' obligations to perform additional work under Section VII Additional Work, shall terminate in any event no later than (i) the issuance of an administrative or judicial order by the Ohio EPA and/or U.S. EPA requiring Respondents, some of them, and/or any other entity, to perform Remedial Design and Remedial Action (RD/RA) activities at the Site after a remedy has been selected for the Site in accordance with the NCP; or (ii) upon unilateral initiation of Remedial Action (RA) at the Site by the Ohio EPA and/or U.S. EPA after a remedy has been selected for the Site in accordance with the NCP.

In the Matter of the Diamond Shamrock Painesville Works Site:

IT IS SO ORDERED:

Donald R. Schregardus, Director
Ohio Environmental Protection Agency

SEP 27 1995
Date

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavins Date 4-27-95

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

WAIVER AND AGREEMENT

A. In order to resolve disputed claims, without admission of fact, violation, or liability, Respondent agrees that these Findings and Orders are lawful and reasonable, and agrees to perform all actions required by these Orders.

B. Respondent hereby waives the right to appeal the issuance, terms and conditions, and service of these Orders and hereby waives any and all rights that it may have to seek judicial review of the issuance, terms and conditions, and service of these Orders either in law or equity.

C. Notwithstanding the limitations herein on Respondent's right to appeal or seek judicial review, the Ohio EPA and Respondent agree that in the event that these Orders are appealed by any other party to the Environmental Board of Review, or any court, Respondent retains the right to intervene and participate in such appeal. In such event, Respondent shall continue to comply with these Orders notwithstanding such appeal and intervention unless these Orders are stayed, vacated or modified.

IT IS SO AGREED:

Respondent Maxus Energy Corporation:

W. Mark Miller — August 29, 1995
Date

W. Mark Miller
Typed or printed name

Vice President Operations and Planning
Title

OHIO ENVIRONMENTAL PROTECTION AGENCY:

Donald R. Schregardus, Director — SEP 27 1995
Date

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date: 9-27-95

WAIVER AND AGREEMENT

A. In order to resolve disputed claims, without admission of fact, violation, or liability, Respondent agrees that these Findings and Orders are lawful and reasonable, and agrees to perform all actions required by these Orders.

B. Respondent hereby waives the right to appeal the issuance, terms and conditions, and service of these Orders and hereby waives any and all rights that it may have to seek judicial review of the issuance, terms and conditions, and service of these Orders either in law or equity.

C. Notwithstanding the limitations herein on Respondent's right to appeal or seek judicial review, the Ohio EPA and Respondent agree that in the event that these Orders are appealed by any other party to the Environmental Board of Review, or any court, Respondent retains the right to intervene and participate in such appeal. In such event, Respondent shall continue to comply with these Orders notwithstanding such appeal and intervention unless these Orders are stayed, vacated or modified.

IT IS SO AGREED:

Respondent CHEMICAL LAND HOLDINGS, INC.

By: M M Skaggs, Jr. 8-29-95
Date

Morton M. Skaggs, Jr.
Typed or printed name

President
Title

OHIO ENVIRONMENTAL PROTECTION AGENCY:

Donald R. Schregardus, Director SEP 27 1995
Date

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

WAIVER AND AGREEMENT

A. In order to resolve disputed claims, without admission of fact, violation, or liability, Respondent agrees that these Findings and Orders are lawful and reasonable, and agrees to perform all actions required by these Orders.

B. Respondent hereby waives the right to appeal the issuance, terms and conditions, and service of these Orders and hereby waives any and all rights that it may have to seek judicial review of the issuance, terms and conditions, and service of these Orders either in law or equity.

C. Notwithstanding the limitations herein on Respondent's right to appeal or seek judicial review, the Ohio EPA and Respondent agree that in the event that these Orders are appealed by any other party to the Environmental Board of Review, or any court, Respondent retains the right to intervene and participate in such appeal. In such event, Respondent shall continue to comply with these Orders notwithstanding such appeal and intervention unless these Orders are stayed, vacated or modified.

IT IS SO AGREED:

Respondent OCCIDENTAL CHEMICAL CORPORATION (as successor to Diamond Shamrock Chemicals Company)

By: J Alan Mack 8/28/95
Date

J. Alan Mack
Typed or printed name

Associate General Counsel
Title

OHIO ENVIRONMENTAL PROTECTION AGENCY:

Donald R. Schregardus, Director SEP 27 1995
Date

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By _____ Date 9-27-95

WAIVER AND AGREEMENT

A. In order to resolve disputed claims, without admission of fact, violation, or liability, Respondent agrees that these Findings and Orders are lawful and reasonable, and agrees to perform all actions required by these Orders.

B. Respondent hereby waives the right to appeal the issuance, terms and conditions, and service of these Orders and hereby waives any and all rights that it may have to seek judicial review of the issuance, terms and conditions, and service of these Orders either in law or in equity.

C. Notwithstanding the limitations herein on Respondent's right to appeal or seek judicial review, the Ohio EPA and Respondent agree that in the event that these Orders are appealed by any other party to the Environmental Board of Review, or any court, Respondent retains the right to intervene and participate in such appeal. In such event, Respondent shall continue to comply with these Orders notwithstanding such appeal and intervention unless these Orders are stayed, vacated or modified.

IT IS SO AGREED:

Respondent: Village of Fairport Harbor

Thomas M. Coffman — Date: SEPT. 12, 1995

9-12-95

MAYOR, VILLAGE OF FAIRPORT HARBOR
Title

Linda Sentinek
Notary Public - State of Ohio
My Commission Expires Dec. 12, 1999
(Recorded in Lake County)

OHIO ENVIRONMENTAL PROTECTION AGENCY:

Donald R. Schregardus, Director — Date

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

WAIVER AND AGREEMENT

A. In order to resolve disputed claims, without admission of fact, violation, or liability, Respondent agrees that these Findings and Orders are lawful and reasonable, and agrees to perform all actions required by these Orders.

B. Respondent hereby waives the right to appeal the issuance, terms and conditions, and service of these Orders and hereby waives any and all rights that it may have to seek judicial review of the issuance, terms and conditions, and service of these Orders either in law or equity.

C. Notwithstanding the limitations herein on Respondent's right to appeal or seek judicial review, the Ohio EPA and Respondent agree that in the event that these Orders are appealed by any other party to the Environmental Board of Review, or any court, Respondent retains the right to intervene and participate in such appeal. In such event, Respondent shall continue to comply with these Orders notwithstanding such appeal and intervention unless these Orders are stayed, vacated or modified.

IT IS SO AGREED:

Respondent Uniroyal Chemical Company Inc xx on its own behalf and as successor to the chemical business of Uniroyal, Inc. with respect to this matter:

Robert J. Mazaika — 8/29/95
Typed or printed name — Date

President
Title

OHIO ENVIRONMENTAL PROTECTION AGENCY:

Donald R. Schregardus, Director — SEP 27 1995
Date

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

WAIVER AND AGREEMENT

A. In order to resolve disputed claims, without admission of fact, violation, or liability, Respondent agrees that these Findings and Orders are lawful and reasonable, and agrees to perform all actions required by these Orders.

B. Respondent hereby waives the right to appeal the issuance, terms and conditions, and service of these Orders and hereby waives any and all rights that it may have to seek judicial review of the issuance, terms and conditions, and service of these Orders either in law or equity.

C. Notwithstanding the limitations herein on Respondent's right to appeal or seek judicial review, the Ohio EPA and Respondent agree that in the event that these Orders are appealed by any other party to the Environmental Board of Review, or any court, Respondent retains the right to intervene and participate in such appeal. In such event, Respondent shall continue to comply with these Orders notwithstanding such appeal and intervention unless these Orders are stayed, vacated or modified.

IT IS SO AGREED:

Respondent Painesville Township Board of Trustees:

August 28, 1995
Date

James S. Falvey
Typed or printed name

Chairman
Title

OHIO ENVIRONMENTAL PROTECTION AGENCY:

SEP 27 1995
Date

Donald R. Schregardus, Director

OHIO E.P.A.
SEP 27 95
CERTIFIED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

WAIVER AND AGREEMENT

A. In order to resolve disputed claims, without admission of fact, violation, or liability, Respondent agrees that these Findings and Orders are lawful and reasonable, and agrees to perform all actions required by these Orders.

B. Respondent hereby waives the right to appeal the issuance, terms and conditions, and service of these Orders and hereby waives any and all rights that it may have to seek judicial review of the issuance, terms and conditions, and service of these Orders either in law or equity.

C. Notwithstanding the limitations herein on Respondent's right to appeal or seek judicial review, the Ohio EPA and Respondent agree that in the event that these Orders are appealed by any other party to the Environmental Board of Review, or any court, Respondent retains the right to intervene and participate in such appeal. In such event, Respondent shall continue to comply with these Orders notwithstanding such appeal and intervention unless these Orders are stayed, vacated or modified.

IT IS SO AGREED:

Painesville PRP Group (Membership list is Attachment I to this page.)

William C. Hutton — August 30, 1995
Date

William C. Hutton
Typed or printed name

Chairman
Title

OHIO ENVIRONMENTAL PROTECTION AGENCY

Donald R. Schregardus, Director — SEP 27 1995
Date

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

Painesville PRP Group Membership List

Maxus Energy Corporation
Contact: Mr. William C. Hutton, General Manager, Special Projects
Maxus Energy Corporation
717 North Harwood Street
Dallas, Texas 75201

Chemical Land Holdings, Inc.
Contact: Mr. William C. Hutton, General Manager, Special Projects
Maxus Energy Corporation
717 North Harwood Street
Dallas, Texas 75201

Occidental Chemical Corporation
Contact: Mr. William C. Hutton, General Manager, Special Projects
Maxus Energy Corporation
717 North Harwood Street
Dallas, Texas 75201

Chelmsford Properties, Inc.
Contact: Mr. Joseph Urbanick, President
Chelmsford Properties, Inc.
310 Park Drive
Chardon, Ohio 44024

Fairport Harbor-Board of Education
Contact: Dr. J. M. Petersen, Superintendent
Fairport Harbor Board of Education
329 Vine Street
Fairport Harbor, Ohio 44077

Steven W. & Calvina J. Gagat
Contact: Steven W. or Calvina J. Gagat
c/o Fairport Machine & Manufacturing, Inc.
P.O. Box 1072
1150 East Street
Fairport Harbor, Ohio 44077

Non-responsive

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cevin Date 9-27-95

OHIO E.P.A.
SEP 27 95
RECEIVED DIRECTOR'S JOURNAL

Hach Excavation & Demolition, Inc./Little Seedlings/Paul W. and Marlene E. Hach
Contact: Paul W. Hach, President
Hach Excavating & Demolition, Inc.
2000 Fairport Nursery Road
Fairport Harbor, Ohio 44077

James Paul Management, Inc.
Contact: Mr. Jerome Leeds
1002 Third Street
Fairport Harbor, Ohio 44077

R. M. Lederer
Contact: Ralph M. Lederer
1004 Second Street
Fairport Harbor, Ohio 44077

RDL Properties
Contact: Robert L. Leach
29339 Euclid Ave.
Wickliffe, Ohio 44092

Schuster Service, Inc.
Mr. Nyle Schuster
Schuster's Service, Inc.
223 Eagle Street
Fairport Harbor, Ohio 44077

Village of Fairport Harbor
Contact: Mr. Thomas M. Coffman, Mayor
Village of Fairport Harbor
220 Third Street
Fairport Harbor, Ohio 44077

Painesville Township Board of Trustees
Contact: Mr. Frank W. Svegel, Township Administrator
Painesville Township
55 Nye Road
Painesville, Ohio 44077

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

LAKE COUNTY

PUBLIC NOTICE

OHIO ENVIRONMENTAL PROTECTION AGENCY

Notice is hereby given that the Director of the Ohio Environmental Protection Agency (Ohio EPA) has issued as a final action Director's Final Findings and Orders as an Administrative Consent Order in the matter of the Diamon Shamrock Painesville Works Site, in Fairport Harbor, Ohio, with the following entities as the settling respondents: Chemical Land Holdings, Inc., Maxus Energy Corporation, Occidental Chemcial Corporation, Painesville Township Board of Trustees, Uniroyal Chemical Company, Inc., Village of Fairport Harbor, and the Painesville PRP Group. The effective date of this final action is September 27, 1995. The Administrative Consent Order requires the Respondents to complete a remedial investigation and feasibility study at the site. The action of the Director is final and may be appealed to the Environmental Board of Review (EBR) pursuant to Section 3745.04 of the Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the EBR within thirty (30) days after notice of the Director's action. A copy of the appeal must be served upon the Director of the Ohio EPA within three (3) days of filing at the EBR. The EBR's address is:

Environmental Board of Review
236 East Town Street
Room 300
Columbus, Ohio 43215

A copy of Administrative Consent Order may be obtained from the Hearing Clerk, Ohio EPA, P. O. Box 1049, 1800 WaterMark Drive, Columbus, Ohio 43266-0149.

NUMBER: DERR-00-RR-006
ISSUED: 05-26-92
STATUS: FINAL

SUBJECT: GENERIC STATEMENT OF WORK, REMEDIAL INVESTIGATION/FEASIBILITY STUDY, STATE VERSION

OHIO E.P.A. SEP 27 '95 RECEIVED DIRECTOR'S JOURNAL

PURPOSE:

The purpose of this remedial investigation/feasibility study (RI/FS) is to investigate the nature and extent of releases of hazardous waste or constituents, pollutants, wastes, industrial wastes or contaminants at the Site, assess the potential risk to human health and the environment, and develop and evaluate potential remedial alternatives. The RI and FS are interactive and may be conducted concurrently so that the data collected in the RI influences the development of remedial alternatives in the FS, which in turn affects the data needs and the scope of treatability studies.

The Respondent shall conduct this RI/FS and shall produce an RI and FS report that are in accordance with this statement of work, the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (RI/FS Guidance) (U.S. EPA, Office of Emergency and Remedial Response, October 1988), and any other guidances that Ohio EPA uses in conducting an RI/FS (a list of the primary guidances is attached), as well as any additional requirements in the administrative order. The RI/FS Guidance describes the report format and the required report content. The Respondent shall furnish all necessary personnel, materials, and services needed, or incidental to, performing the RI/FS, except as otherwise specified in the administrative order.

At the completion of the RI/FS and the terms of this Order, the Ohio EPA shall be responsible for the selection of a site remedy. The remedial action alternative selected by the Ohio EPA shall meet the cleanup standards specified in the How Clean Is Clean Policy. That is, the selected remedial action will be protective of human health and the environment, shall be in compliance with applicable or relevant and appropriate requirements of other laws, will be cost-effective, shall utilize permanent solutions and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable, and shall address the statutory preference for treatment as a principal element. The final RI and FS reports, as approved by the Ohio EPA, shall, with the administrative record, form the basis for the selection of the site's remedy and will provide the information necessary to support the development of a decision document.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 4-27-95

SUBJECT: GENERIC STATEMENT OF WORK, REMEDIAL INVESTIGATION/FEASIBILITY STUDY, STATE VERSION

The Ohio EPA shall provide oversight of the Respondent's activities throughout the RI/FS. The Respondent shall support the Ohio EPA's initiation and conduct of activities related to the implementation of oversight activities.

TASKS/DELIVERABLES:

The Remedial Investigation/Feasibility Study consists of eleven tasks:

TASK 1 -- Scoping of the RI/FS

- A. Site Background/Site History
- B. Current or Previous Interim/Emergency Actions

TASK 2 -- Work Plan Requirements

- A. RI/FS Work Plan
- B. Quality Assurance Project Plan
- C. Field Sampling Plan
- D. Health and Safety Plan

TASK 3 -- Interim Actions

TASK 4 -- Community Relations

TASK 5 -- Remedial Investigation

- A. Environmental Setting
- B. Source Characterization
- C. Contamination Characterization
- D. Ecological Assessment
- E. Potential Receptor Identification
- F. RI report

TASK 6 -- Human Health Baseline Risk Assessment

- A. Conceptual Site Model

B. Human Risk Assessment Report

TASK 7 -- Environmental Baseline Risk Assessment

A. Conceptual Site Model
B. Environmental Risk Assessment Report

TASK 8 -- Development and Screening Alternatives

A. Remedial Action Objectives
B. Technologies Screening
C. Alternatives Array

TASK 9 -- Treatability Study

A. Treatability Study Work Plan
B. Treatability Study Evaluation Report

TASK 10 -- Detailed Analysis of Alternatives

A. Detailed Analysis of Alternatives Report
B. Feasibility Study Report

TASK 11 -- Monthly Progress Reports

OHIO E.P.A.
SEP 27 95
RECORD DIRECTOR'S JOURNAL

TASK 1 -- SCOPING OF THE RI/FS

The Respondent shall describe the background of the Site, its history and current condition and outline the purpose and need for remedial investigation of the Site. Data gathered during previous investigations, site inspections and other relevant activities shall be used. Previous investigations shall be summarized and referenced. This information shall be documented in the RI/FS Work Plan (Task 2.A.).

A. Site Background/Site History

The Respondent shall review and analyze all existing site background information and will conduct a site visit to assist in planning the scope of the RI/FS.

1. Collect and analyze existing data and document the need

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

for additional data

Before planning RI/FS activities, all existing site data will be thoroughly compiled and reviewed by the Respondent. Specifically, this will include presently available data relating to the varieties and quantities of hazardous, industrial and/or other wastes at the Site, and past disposal practices. This will also include results from any previous sampling events that may have been conducted. The Site background may reference applicable existing reports. The Respondent shall provide, at a minimum, the following:

a. Map(s) depicting property lines, topography and surface drainage, all known active or past treatment, storage or disposal areas, all known past and present product and waste underground storage tanks and associated piping, surrounding land use and location of wells;

b. A history and description of ownership and operation;

c. A summary of past and present permits requested and/or received;

d. A summary of known or suspected source areas; and

e. A summary of any previous response action conducted by state, local, federal or private parties.

The Respondent shall refer to Table 2-1 of the RI/FS Guidance for a comprehensive list of data collection information sources. This information will be utilized in determining additional data needed to characterize the Site, better define potential applicable requirements, and develop a range of preliminarily identified remedial alternatives. Data Quality Objectives (DQOs) will be established subject to Ohio EPA approval which specify the usefulness of existing data. Decisions on the necessary data and DQOs will be made by the Ohio EPA.

The Respondent shall provide an annotated bibliography of existing reports for the Site, including reports relevant to the RI/FS.

2. Conduct Site Visit

The Respondent shall conduct a site visit during the project scoping phase to assist in developing a conceptual understanding of sources and areas of contamination as well as potential exposure pathways and receptors at the site. During the site visit the Respondent shall observe the Site's physiography, hydrology, geology, and demographics, as well as natural resources, ecological and cultural features and receptors. This information will be utilized to better scope the project and to determine the extent of additional data necessary to characterize the site, better define potentially applicable requirements and narrow the range of preliminarily identified remedial alternatives.

OHIO E.P.A. SEP 27 95
FILED DIRECTOR'S JOURNAL

B. Implementation of Interim/Emergency Actions.

1. The Respondent's report shall document any interim or emergency action which were or are being undertaken at the Site. This shall include:

   a. Objectives of the interim or emergency actions: how the action has mitigated or is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long term remedial action at the Site;

   b. Design, construction, operation and maintenance requirements;

   c. Schedules for design, construction and monitoring; and

   d. Schedule for progress reports.

Respondent shall submit a report to the Ohio EPA documenting the results of Tasks 1.A.1., 1.A.2. and 1.B.1. as part of the of the RI/FS Work Plan.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

TASK 2 -- RI/FS WORK PLAN REQUIREMENTS

At the conclusion of the scoping phase, the Respondent will submit an RI/FS work plan, a field sampling plan, a Quality Assurance Project Plan (QAPP), and a site health and safety plan. The RI/FS work plan, field sampling plan, and QAPP must be reviewed and approved by Ohio EPA prior to the initiation of field activities.

A. RI/FS Work Plan

A work plan documenting the decisions and evaluations completed during the scoping process will be submitted to Ohio EPA for review and approval. The work plan should be developed in conjunction with the QAPP, field sampling plan and the site health and safety plan, although each plan may be delivered under separate cover. The RI/FS Work Plan will also include a comprehensive description of the work to be performed as outlined in this SOW, including the methodologies to be utilized, as well as a corresponding schedule for completion. In addition, the work plan must include the rationale for performing the required activities.

In the RI/FS Work Plan, the Respondent shall present the justification for the proposed omission of any tasks of this SOW because of work that has already been performed or work that is not appropriate to the Site.

The RI/FS Work Plan will present a statement of the real or potential problem(s) posed by the Site and the objectives of the RI/FS. Furthermore, the plan will include a site background summary setting forth the Site description including the geographic location of the Site, and to the extent possible, a description of the Site's physiography, hydrology, geology, demographics, ecological, cultural and natural resource features; a synopsis of the site history and a description of previous responses that have been conducted at the site by local, state, federal, or private parties; a summary of the existing data in terms of physical and chemical characteristics of the contaminants identified, and their distribution among the environmental media at the site.

In addition, the plan will include a description of the site

management strategy developed during scoping and data needs for evaluation of remedial alternatives. The plan will reflect coordination with treatability study requirements. The RI/FS Work Plan shall provide sufficient information for the Ohio EPA to identify applicable or relevant and appropriate Federal and state requirements (chemical-specific, location-specific and action-specific).

The RI/FS work plan shall provide a detailed description of the tasks to be performed, information needed for each task (e.g., for human health and environmental risk evaluation), information to be produced during and at the conclusion of each task, and a description of the work products that will be submitted to the Ohio EPA. This includes the deliverables set forth in the remainder of this statement of work: a schedule for each of the required activities; the conceptual site model for and the human health baseline risk assessment; the conceptual site model for and the environmental baseline risk assessment; the RI report; the FS report and required interim deliverables; monthly reports to the Ohio EPA; and meetings and presentations to the Ohio EPA at the conclusion of each major phase of the RI/FS.

Because of the unknown nature of the Site and iterative nature of the RI/FS, additional data requirements and analyses may be identified throughout the process. The Respondent will submit a technical memorandum documenting the need for additional data, and identifying the DQOs whenever such requirements are identified. In any event, the Respondent is responsible for fulfilling additional data and analysis needs identified by the Ohio EPA consistent with the purposes and objectives of this RI/FS.

B. Quality Assurance Project Plan

The Respondent shall prepare a plan to document all monitoring and investigation procedures: sampling, field measurements, sample analysis, toxicity testing, bioassay, and all modeling performed during the investigation to characterize the environmental setting, source(s), contamination, and human and biological receptors to ensure that all information, data and resulting decisions are technically sound, statistically valid and properly documented. This plan shall comport with Ohio EPA's Guidelines and Specifications for Preparing Quality

OHIO E.P.A. SEP 27 '95
DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

BY: [illegible] DATE: 9-22-95

Assurance Projects Plans, policy number DERR-00-RR-008. As required by Section VIII, Paragraph C, of this Order, Respondent shall schedule a meeting with this Agency to discuss the requirements of this plan.

1. Data Collection Strategy

The strategy section of the (QAPP) shall include but not be limited to the following:

a. Description of the types and intended uses for the data, relevance to remediation or restoration goals, and the necessary level of precision, accuracy, and statistical validity for these intended uses;

b. Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;

c. Description of the rational used to assure that the data accurately and precisely represent a characteristic of a population, variation of physical or chemical parameters throughout the Site, a process condition or an environmental condition. Factors which shall be considered and discussed include, but are not limited to:

i) Environmental conditions at the time of sampling;

ii) Sampling design (including number, location and distribution);

iii) Representativeness of selected media, exposure pathways, or receptors; and

iv) Representativeness of selected analytical parameters.

v) Representativeness of testing procedures and conditions; and

vi) Independence of background or baseline from site influences.

d. Description of the measures to be taken to assure that the following data sets can be compared quantitatively or qualitatively to each other:

i) RI data collected by the Respondent over some time period;

ii) RI data generated by an outside laboratory or consultant employed by the Respondent versus data collected by the Respondent, and;

iii) Data generated by separate consultants or laboratories over some time period not necessarily related to the RI effort.

iv) Data generated by Ohio EPA or by an outside laboratory or consultant employed by Ohio EPA;

e. Details relating to the schedule and information to be provided in quality assurance reports. These reports should include but not be limited to:

i) Periodic assessment of measurement data accuracy, precision and completeness;

ii) Results of performance audits;

iii) Results of system audits;

iv) Significant quality assurance problems and recommended solutions; and

v) Resolutions of previously stated problems.

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

2. Sample Analysis

The Sample Analysis section of the Quality Assurance Project Plan shall specify the following:

a. Chain-of-custody procedures, including:

i) Identification of a responsible party to act as sample custodian at the laboratory facility

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

authorized to sign for incoming field samples, obtain documents of shipment and verify the data entered onto the sample custody records;

ii) Provision for a laboratory sample custody log consisting of serially numbered lab-tracking report sheets; and

iii) Specification of laboratory sample custody procedures for sample handling, storage and dispersement for analysis.

b. Sample storage procedures and storage times;

c. Sample preparation methods;

d. Analytical procedures, including:

i) Scope and application of the procedure;

ii) Sample matrix;

iii) Potential interferences;

iv) Precision and accuracy of the methodology;

v) Method detection limits;

vi) Special analytical services required to ensure contract required detection limits do not exceed known toxicity criteria; and

vii) Verification and reporting of tentatively identified compounds.

e. Calibration procedures and frequency;

f. Data reduction, validation and reporting;

g. Internal quality control checks, laboratory performance and systems audits and frequency, including:

i) Method blank(s);

ii) Laboratory control sample(s);

iii) Calibration check sample(s);

iv) Replicate sample(s);

v) Matrix-spiked sample(s);

vi) "Blind" quality control sample(s);

vii) Control charts;

viii) Surrogate samples;

ix) Zero and span gases; and

x) Reagent quality control checks.

h. Preventative maintenance procedures and schedules;

i. Corrective action (for laboratory problems); and

j. Turnaround time.

3. Modeling

The Modeling section of the Quality Assurance Project Plan shall apply to all models used to predict or describe fate, transport or transformation of contaminants in the environment and shall discuss:

a. Model assumptions and operating conditions;

b. Input parameters; and

c. Verification and calibration procedures.

4. In Situ or Laboratory Toxicity Tests

The Toxicity Test section of the Quality Assurance Project Plan shall apply to all tests or bioassay used to predict or describe impacts of contaminants on a population, community, or ecosystem level.

OHIO E.P.A.
SEP 27 95
FILED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

5. Data Record

The QAPP shall also provide the format to be used to present the raw data and the conclusions of the investigation, as described in a,b, and c below:

a. The data record shall include the following:

i) Unique sample or field measurement code;

ii) Sampling or field measurement location and sample or measurement type;

iii) Sampling or field measurement raw data;

iv) Laboratory analysis ID number;

v) Property or component measured; and

vi) Result of analysis (e.g., concentration).

b. Tabular Displays

The following data shall be presented in tabular displays:

i) Unsorted (raw) data;

ii) Results for each medium, organism, or for each constituent measured;

iii) Data reduction for statistical analysis;

iv) Sorting of data by potential stratification factors (e.g., location, soil layer, topography, vegetation form);

v) Summary data (i.e., mean, standard deviation, min/max values, and sample number); and

vi) Comparisons with background or reference data.

c. Graphical Displays

The following data shall be presented in graphical

formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

i) Display sampling locations and sampling grid;

ii) Indicate boundaries of sampling area, and areas where more data are required;

iii) Display levels of contamination at each sampling location or location from which organism was taken;

iv) Display geographical extent of contamination;

v) Display contamination levels, averages and maxima;

vi) Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters;

vii) Indicate features affecting intramedia transport and show potential receptors;

viii. Compare nature and extent of contamination with results of ecological or biological sampling or measurements; and

ix) Display comparisons with background or reference analyses or measurements.

C. Field Sampling Plan

1. Sampling

The Sampling section of the Field Sampling Plan shall discuss:

a. Sufficient preliminary sampling to ensure the proper planning of b through o below;

b. Selecting appropriate sampling locations, depths

OHIO E.P.A. SEP 27 95
FILED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

vegetation strata, organism age, etc. and documenting relevance of sample for intended biological toxicity tests or analyses;

c. Providing a sufficient number of samples to meet statistical or other data useability objectives;

d. Measuring all necessary ancillary data such as ambient conditions, baseline monitoring, etc.;

e. Determining environmental conditions under which sampling should be conducted;

f. Determining which media, pathways, or receptors are to be sampled (e.g., ground water, air, soil, sediment, biota, etc.);

g. Determining which parameters are to be measured and where;

h. Selecting the frequency and length of sampling period;

i. Selecting the sample design (e.g., composites, grabs, random, repeated, etc.);

j. Selecting the number, location, media or organisms for determining background conditions or reference conditions (refer to Appendix B, Background Sampling Guidance, of Ohio EPA's How Clean Is Clean Policy);

k. Measures to be taken to prevent contamination of the sampling equipment and cross contamination between sampling points;

l. Documenting field sampling operations and procedures, including;

   i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters and adsorbing reagents);

   ii) Procedures and forms for recording the exact location and specific considerations

associated with sample acquisition;

iii) Documentation of specific sample preservation method;

iv) Calibration of field devices;

v) Collection of replicate and field duplicate samples;

vi) Submission of field-biasedand equipment blanks, where appropriate;

vii) Potential interferences present at the site or facility;

viii) Construction materials and techniques associated with monitoring wells and piezometers;

ix) Field equipment listing and sample containers;

x) Sampling order; and

xi) Decontamination procedures.

m. Selecting appropriate sample containers;

n. Sample preservation; and

o. Chain-of-custody, including:

i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment;

ii) Sample sealing, storing and shipping procedures to protect the integrity of the sample; and,

iii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

OHIO E.P.A.
SEP 27 95
FIELD DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

2. Field Measurements

The Field Measurements section of the Field Sampling Plan shall discuss:

a. Selecting appropriate field measurement locations, depths, organism age etc.;

b. Providing a sufficient number of field measurements that meet statistical or data useability objectives;

c. Measuring all necessary ancillary data such as ambient or baseline environmental conditions;

d. Determining conditions under which field measurement should be conducted;

e. Determining which media, pathways, or receptors are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, biota, etc.);

f. Determining which physical, chemical, or biological parameters are to be measured and where;

g. Selecting the frequency and duration of field measurement; and

h. Documenting field measurement operations and procedures, including:

i) Procedures and forms for recording raw data and the exact location, time and Site specific considerations associated with the data acquisition;

ii) Calibration of field devices;

iii) Collection of replicate measurements;

iv) Submission of field-biased blanks, where appropriate;

v) Potential interferences present at the Site;

vi) Construction materials and techniques associated with monitoring wells and piezometers used to collect field data;

vii) Field equipment listing;

viii) Order in which field measurements were made; and

ix) Decontamination procedures; and

i. Selecting the number, location, media, and organisms for determining background or reference conditions.

OHIO E.P.A. SEP 27 95 DIRECTOR'S JOURNAL

D. Health and Safety Plan.

The Respondent shall develop a Health and Safety plan to protect the health and safety of personnel involved in the site investigations and the surrounding community.

1. Major elements of the Health and Safety Plan shall include:

a. Facility or site description including availability of resources such as roads, water supply, electricity and telephone service;

b. Description of the known hazards and an evaluation of the risks associated with the incident and with each activity conducted;

c. Listing of key personnel (including the site safety and health officer) and alternates responsible for site safety, response operations, and for protection of public health;

d. Delineation of work area, including a map;

e. Description of levels of protection to be worn by personnel in the work area;

f. Description of the medical monitoring program for on-site responders;

g. Description of standard operating procedures

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

established to assure the proper use and maintenance of personal protective equipment;

h. The establishment of procedures to control site access;

i. Description of decontamination procedures for personnel and equipment;

j. Establishment of site emergency procedures;

k. Availability of emergency medical care for injuries and toxicological problems;

l. Description of requirements for an environmental monitoring program. (This should include a description of the frequency and type of air and personnel monitoring, environmental sampling techniques and a description of the calibration and maintenance of the instrumentation used.);

m. Specification of any routine and special training required for responders; and

n. Establishment of procedures for protecting workers from weather-related problems.

2. The Health and Safety Plan shall be consistent with:

a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);

b. Section 111(c)(6) of CERCLA;

c. EPA Order 1440.3 -- Respiratory Protection;

d. EPA Order 1440.2 -- Health and Safety Requirements for Employees Engaged in Field Activities;

e. EPA Occupational Health and Safety Manual;

f. EPA Interim Standard Operating Safety Procedures and other EPA guidance as developed by EPA;

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

g. OSHA regulations particularly in 29 CFR 1910 and 1926;

h. State and local regulations; and

i. Site or facility conditions.

The Safety Plan should identify problems or hazards that may be encountered and their solution. Safety procedures to be followed to protect third parties, such as visitors or the surrounding community, should also be provided.

TASK 3 -- INTERIM ACTIONS

A. At any time during the Remedial Investigation, the Respondent may propose to conduct or the Ohio EPA may require that the Respondent conduct an interim remedial action(s). Any interim remedial action proposed by the Respondent for the Site must be approved by the Ohio EPA prior to implementation. The following factors shall be considered in determining the appropriateness of an interim remedial action:

1. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous wastes or substances;

2. Actual or potential contamination of drinking water supplies or sensitive ecosystems;

3. Hazardous waste or substances in drums, barrels, tanks or other bulk storage containers that may pose a threat of release;

4. High levels of hazardous waste or substances in soils largely at or near the surface that may migrate;

5. Weather conditions that may cause hazardous waste or substances to migrate or be released;

6. Threat of fire or explosion; and

7. Other situations or factors that may pose threats to public health, welfare or the environment.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: [signature] Date: 9-27-95

B. The Respondent shall develop and submit for approval an Interim Action Work Plan that includes, but is not limited to, the following:

1. A discussion of the technical factors of importance for implementing the Interim Action;

2. A justification for selection of the preferred action and/or system modification based on its ability to meet the interim action criteria of preventing, minimizing or mitigating a substantial threat to the public health or the environment;

3. Treatment, storage or disposal of contaminated media in a manner that complies with federal and state laws, requirements and guidance documents adopted thereunder. Respondent shall obtain any permits necessary for implementation of the Interim Action. Ohio EPA shall consider, in a timely manner, such permit applications which Respondent may be required to submit pursuant to the Interim Action Work Plan;

4. A schedule of tasks, length of tasks and completion times, including any permits, permits-to-install and permits-to-operate, according to calendar days;

5. A monitoring strategy to determine the effectiveness of the Interim Action;

6. A Quality Assurance Project Plan (QAPP) for the Interim Action;

7. a Health and Safety Plan (HASP) for the Interim Action.

C. Within twenty (20) calendar days following Ohio EPA approval of the Interim Action Work Plan, Respondent shall commence implementation of the work as approved and in accordance with the schedule contained therein.

D. Progress on the Interim Action shall be reported in the Monthly Progress Report per Task 11.

TASK 4 -- COMMUNITY RELATIONS

SUBJECT: GENERIC STATEMENT OF WORK, REMEDIAL INVESTIGATION/FEASIBILITY STUDY, STATE VERSION

This task shall be completed by the Ohio EPA.

TASK 5 -- REMEDIAL INVESTIGATION

The Respondent shall conduct those investigations necessary to: characterize the site (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization and Ecological Assessment); and identify actual or potential receptors (Ecological and Human Risk Assessment).

The investigations should result in data of adequate technical quality to support the development of the Human Health Baseline Risk Assessment and the Ecological Risk Assessment and the evaluation of remedial action alternatives of the Feasibility Study.

Remedial Investigation activities shall follow the plans set forth in Task 2. All sampling, analyses, and measurements shall be conducted in accordance with the QAPP. All sampling and measurement locations shall be documented in a log and identified on a detailed site map.

A. Environmental Setting

The Respondent shall collect information to supplement and verify existing information on the environmental setting at the site as well as the environmental setting adjacent to and surrounding the Site. The Respondent shall characterize the following:

1. Regional Hydrogeology

The Respondent shall conduct a program to evaluate the regional hydrogeologic characteristics surrounding the facility. Regional information can be obtained as described in Task 1. This shall include but not be limited to:

a. Depth to bedrock and lithology;

b. Characteristics of major stratigraphic units and the depositional environment;

OHIO E.P.A.
SEP 27 95
FIELD DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

c. Identification of regional aquifer(s);

d. Identification of all residential, municipal, industrial and agricultural wells within a four (4) mile radius of the Site. Include any available information such as well logs, construction details, average yield and chemical analyses;

e. Direction of ground water flow in the regional aquifer(s);

f. Identification and characterization of recharge and discharge areas, with amount of recharge and discharge;

g. Description of regional geomorphology, including locations of surface water bodies and floodways, etc. This description should include an analysis of any topographic features that may influence the ground water flow system; and

h. Description of structural features such as jointing, faulting and folding.

2. Site Hydrogeology and Soil Characteristics

The Respondent shall conduct a program to evaluate site-specific hydrogeologic characteristics and soil characteristics at the Site. This description shall be based on data collected from bore holes, piezometers, laboratory and field tests. The description shall include:

a. An accurate classification and description of the consolidated and unconsolidated stratigraphic units beneath the Site. This shall include:

i) Hydraulic conductivity (vertical and horizontal);

ii) Porosity, effective porosity, and bulk density;

iii) Rock and soil (ASTM 2488 and 2487) classification;

iv) Grain size distribution (sieve and hydrometer) curves;

v) Thickness;

vi) Lateral extent;

vii) Moisture content;

viii) The attenuation capacity and mechanisms of attenuation of the natural earth material and/or fill (i.e., ion exchange capacity, base saturation, organic carbon content, mineral content, soil sorptive capacity, storage capacity);

ix) Soil Ph;

b. The Respondent shall conduct a program to characterize the near surface soil and rock units. This shall include:

i) SCS soil classification;

ii) Surface soil distribution;

iii) Infiltration;

iv) Evapo-transpiration;

c. A discussion of the local occurrence of ground water including:

i) Identification of all aquifer systems, including depth from the surface and lateral and vertical extent. (Aquifer system means one or more geologic unit or formation that is wholly or partly saturated with water and is able to store, transmit and yield significant amounts of water to wells or springs.);

OHIO E.P.A. SEP 27 95 ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

ii) Identification of all significant saturated zones above the aquifer systems;

iii) Depth to the water table;

iv) Ground water flow direction and rates in the aquifers and all strata above the aquifers;

v) Effects of stratification on saturated and unsaturated flow;

vi) Description of the interconnection between the saturated zones and the aquifers, surface water, seeps and springs;

vii) Description of recharge and discharge areas within the site boundaries. This shall include any relationship between ground water and springs, streams and other surface water features;

viii) Temporal fluctuations (i.e., seasonal and man-made) in ground water levels and their effects on ground water flow direction; and

ix) Identification of zones of high permeability that may act as a migration route for contaminants.

d. Hydrogeologic cross sections showing the extent (depth, thickness and lateral extent) of each hydrogeologic unit shall be developed. Cross sections shall be developed in various orientations across the Site (e.g., in the direction of ground water flow and orthogonal to ground water flow). At a minimum the following shall be identified:

i) Structures such as zones of fracturing or channeling likely to influence contaminant migration in the consolidated or unconsolidated deposits;

ii) Zones of higher permeability, such as sand and gravel deposits, that might direct the flow of contaminants;

iii) Zones of low permeability that may restrict and/or attenuate the flow of contaminants; and

iv) Water-bearing zones above the confining layer that may serve as pathways for contaminant migration including perched zones of saturation.

e. Based on data obtained from ground water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:

i) Water level contour and/or potentiometric surface maps;

ii) Hydraulic cross sections showing vertical gradients;

iii) Flow nets, including the vertical and horizontal components of flow and the interconnection between waterbearing strata; and

iv) Any temporal changes in hydraulic gradients and flow directions due, for example, to seasonal or man-made influences.

f. A description of man-made influences that may affect the hydrogeology of the Site, identifying:

i) Active and inactive water supply and production wells with appropriate pumping schedules; and

ii) Man-made structures such as pipelines, french drains, ditches, unlined and lined ponds, lagoons, septic tanks, NPDES permitted outfalls, retention areas and

OHIO E.P.A. SEP 27 95
DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Marie Cavin Date 9-27-95

utility lines.

g. An area-specific description of the geomorphology at the Site. At a minimum this shall include;

   i) An analysis of any topographic feature that mat influence the ground water flow system;

   ii) A surface topography map depicting (at a minimum) streams, wetlands, topographic depressions and springs. The topographic map shall be constructed by a qualified professional and shall provide contour intervals at a level of detail appropriate for the site specific hydrogeologic investigation (e.g., two-foot intervals). The map shall depict the location of all borings, monitoring wells and cross sections.

h. An area-specific description of the structural geology at the Site;

i. The RI report shall document the methods and procedures used to gather and evaluate the hydrogeologic data. These methods and procedures shall be in accordance with Ohio EPA and U.S. EPA guidance. This may include but is not limited to:

   i) The drilling and soil sampling methods used in characterizing the soil and hydrogeologic characteristics of the Site (including all boring logs and raw data);

   ii) The analytical procedures and methods used to characterize the soil and rock materials obtained from the borings and/or test pits;

   iii) The methods, equipment and procedures used to define the aquifer systems and all significant zones of saturation above the uppermost aquifer system including:

      1) Well and piezometer location, depth, construction and installation specifications (including diagrams);

2) Water level measurements and procedures;

3) Ground water seepage observations during drilling; and

4) Pumping tests and slug tests (including type, description and rational for its use, raw data and method of interpreting the results).

iv) A description, rationale and raw data of indirect methods such as soil survey, geophysical and modeling. (These methods can be used to infer ground water characteristics and support or guide direct methods. However, no site remedial investigation can be based strictly on these methods.)

3. Surface Water and Sediment

The Respondent shall conduct a program to characterize any surface water bodies in the vicinity of the Site. Such characterization shall include, but not be limited to, the following activities and information:

a. Description of the temporal and permanent surface water bodies including:

i) For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification and volume;

ii) For impoundments: location, elevation, surface area, depth, volume, freeboard and purpose of impoundment;

iii) For streams, ditches, drains, swamps and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations and flood zones (i.e., 50 and 100 year events);

iv) Drainage patterns;

v) Evapo-transpiration; and

vi) Any other known discharges including those permitted by NPDES

OHIO E.P.A. SEP 27 '95 DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

b. Description of the chemistry of the surface water and sediments. This includes determining the Ph, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients, chemical oxygen demand, total and dissolved organic carbon, specific contaminant concentrations, etc.

c. Description of sediment characteristics including:

i) Deposition area, patterns, and rates;

ii) Thickness profile; and

iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, Ph, etc.)

4. Air

The Respondent shall provide information characterizing the climate in the vicinity of the Site in general, and at the time of the investigation(s). Such information shall include, but not be limited to:

a. A description of the following parameters:

i) Annual and monthly rainfall averages;

ii) Monthly temperature averages and extremes;

iii) Wind speed and direction;

iv) Relative humidity/dew point;

v) Atmospheric pressure;

vi) Evaporation data;

vii) Development of inversions; and

viii) Climate extremes that have been known to occur in the vicinity of the facility, including

frequency of occurrence.

b. A description of topographic and man-made features which affect air flow or emission patterns, including:

i) Ridges, hills or mountain areas;

ii) Canyons or valleys;

iii) Surface water bodies (e.g. rivers, lakes, bays, etc.);

iv) Wind breaks and forests; and

v) Buildings; and

vi) Any other features that may affect air flow or emission patterns.

B. Source Characterization

The Respondent shall collect analytical data to completely characterize the wastes and the areas where wastes have been placed, collected, came to be located or removed including: type (hazardous, solid, residential, industrial, etc.); quantity; physical form; disposition (containment or nature of deposits); and Site characteristics affecting release (e.g., Site security and engineering barriers). Data shall include all information referenced in the Remedial Investigation Work Plan (Task 2). This shall include quantification of the following specific characteristics, at each source area:

1. Unit/Disposal Area characteristics:

a. Location of unit/disposal area;

b. Type of unit/disposal area;

c. Design features;

d. Operating practices (past and present);

e. Period of operation;

OHIO E.P.A. SEP 27 95
FILED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

f. Age of unit/disposal area;

g. General physical conditions; and

h. Method used to close the unit/disposal area.

2. Waste Characteristics:

a. Type of waste placed in the unit;

i) Hazardous classification (e.g., listed, flammable, reactive, corrosive, oxidizing or reducing agent);

ii) Quantity; and

iii) Chemical composition.

b. Physical and chemical characteristics;

i) Physical form (solid, liquid, gas);

ii) Physical description (e.g., powder, oily sludge;

iii) Temperature;

iv) Ph;

v) General chemical class (e.g., acid, base, solvent);

vi) Molecular weight;

vii) Density;

viii) Boiling point;

ix) Viscosity;

x) Solubility in water;

xi) Cohesiveness of the wastes;
xii) Vapor pressure; and

xiii) Flash point.

c. Migration and dispersal characteristics of the waste;

i) Sorption;

ii) Biodegradability, bioconcentration, biotransformation;

iii) Photodegradation rates;

iv) Hydrolysis rates;

v) Chemical transformations;

vi) Chemical interactions; and

vii) Products of all such reactions or processes.

The Respondent shall document the procedures used in making the above determinations.

C. Contamination Characterization

The respondent shall collect analytical data on air, ground water, soils, surface water, sediment and subsurface gas contamination in the vicinity of the Site. This data shall be sufficient to define the extent, origin, direction and rate of movement of contaminants. Data shall include all information referenced in the Remedial Investigation Work Plan (Task 2). The Respondent shall address the following types of contamination at the Site:

1. Ground Water Contamination

The Respondent shall conduct a ground water investigation to characterize the nature and extent of any plumes of contamination at the Site. The investigation shall include a description and quantification of ground water quality in the aquifer systems and all significant zones of saturation or permeable zones that may act as pathways for contaminant migration. This investigation shall at a minimum provide the following information:

a. A description of the horizontal and vertical extent

OHIO E.P.A. SEP 27 95 FILED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Maria Cavin Date 9-27-95

of any immiscible or dissolved plume(s) originating from the Site;

b. The horizontal and vertical direction of contamination movement;

c. The velocity of contaminant movement;

d. The horizontal and vertical concentration profiles of Appendix VIII constituents in the plume(s);

e. An evaluation of site specific factors influencing the plume movement;

f. An extrapolation of future contaminant movement; and

g. An investigation to characterize the nature and extent of contamination of residential, municipal, industrial and agricultural wells within the vicinity of the Site.

The Respondent shall document the procedures used in making the above determinations (e.g., well design, well-construction, geophysics, modeling, etc.). These procedures shall comport with appropriate U.S. EPA and Ohio EPA guidance.

2. Soil Contamination

The Respondent shall conduct an investigation to characterize the nature and extent of contamination of the soil and rock units in the vicinity of the contaminant release. The investigation shall include the following information:

a. A description of the vertical and horizontal extent and pattern of contamination;

b. A description of contaminant and soil chemical physical, and biological properties within the contaminant source area and plume. This includes a site specific discussion of contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradation, hydrolysis, photolysis, oxidation and other factors that might affect

contamination migration and transformation;

c. Specific contaminant concentrations;

d. The velocity and direction of contaminant movement; and

e. An extrapolation of future contaminant movement.

The Respondent shall document the procedures used in making the above determinations.

3. Surface Water and Sediment Contamination

The Respondent shall conduct a investigation to characterize the nature and extent of contamination in surface water bodies and sediment resulting from contaminant releases at the Site. The investigation shall include, but not be limited to, the following information:

a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Site, and the extent of contamination in underlying sediments;

b. The horizontal and vertical direction of contaminant movement in surface water and sediment;

c. The contaminant velocity;

d. An evaluation of the physical, biological and chemical factors influencing contaminant movement;

e. An extrapolation of future contaminant movement; and

f. A description of the chemistry of the contaminated surface waters and sediments. This includes determining the Ph, total dissolved solids, specific contaminant concentrations, etc.

Respondent shall document the procedures used in making the above determinations.

OHIO E.P.A.
SEP 27 95
RECORD DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

4. Air Contamination

The Respondent shall conduct an investigation to characterize the nature and extent of particulate and gaseous contaminants released into the atmosphere. The investigation shall provide the following information:

a. A description of the horizontal and vertical direction and velocity of contaminant movement;

b. The rate and amount of the release;

c. Chemical and physical nature of contaminated particulates including respirable portion, source emission rates, contaminant concentrations in respirable portions;

d. Existing or potential human or biological receptors, of air contaminants, including respirable contaminant concentrations at known or potential receptors; and

e. The chemical and physical composition of the contaminant(s) released, including vertical and horizontal concentration profiles; and

f. Environmental factors that alter or mitigate fate and transport of contaminants in the atmosphere.

The Respondent shall document the procedures used in making the above determinations.

5. Subsurface Gas Contamination

The Respondent shall conduct an investigation to characterize the nature and extent of subsurface gases emitted from buried hazardous, industrial and/or other waste and hazardous constituents in the soil and/or ground water. This investigation shall include the following information:

a. A description of the horizontal and vertical extent of subsurface gases migration;

b. The chemical composition of the gases being emitted

from the subsurface or surface;

c. The rate, amount, and density of the gases being emitted; and

d. Horizontal and vertical concentration profiles of the subsurface gases emitted.

The Respondent shall document the procedures used in making the above determinations.

D. Ecological Assessment

The Respondent shall conduct an investigation to characterize any adverse effects to flora and fauna, at the population, community or ecosystem level, that is or has been caused or influenced by contamination from the facility. The data from this investigation shall be collected in a manner that is compatible and concurrent with the other sections of Task 4. The activities described for this section may be performed iteratively and/or in a phased approach as more data is gathered during other portions of the remedial investigation. Therefore, parts of the work plans(s) for this section may be submitted as separate deliverables from Task 2.C., Phase I Ecological Assessment.

1. Site Characterization

Based on existing data and limited field work, the respondent shall consider the following:

a. See Task 1.A. (Site Background/Site History);

b. Identification of potential and probable ecological receptors including threatened and endangered species, unique and sensitive habitats or resources, etc.;

c. Identification of potential or probable exposure points for ecological receptors;

d. Document known or suspected effects of site contaminants to biota; and

e. Additional data needed for site characterization and the rationale for its necessity.

OHIO E.P.A. SEP 27 95 DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Marie Cavin Date 9-27-95

2. Additional Site Characterization (Phase Ib Ecological Assessment)

Based on evaluations from Task 5.D.1. above, if existing information is insufficient to determine the extent and magnitude of adverse impacts and whether a Phase II Ecological Assessment is warranted, the Respondent shall develop work plans for and implement the following in keeping with the requirements of Tasks 2.B. and 2.C.:

a. Identification and evaluation of habitats that are or may be exposed to contamination;

b. Semiquantitative surveys of flora and fauna that are or may be exposed to contamination, which shall include, but not be limited to:

i) All vegetative strata;

ii) Flora and fauna in all contaminated media;

iii) Population parameters (e.g., density, frequency, age distribution); and

iv) Community parameters (e.g., diversity, structure, stability).

c. Identification of background or reference area for each exposed population, community or ecosystem and completion of surveys for comparison to Tasks 5.D.2.a. and 5.D.2.b. above; and

d. Sampling of media or biota for accumulation or intake studies and toxicity tests to determine the extent of toxicity as related to areas of known or potential contamination of contaminant concentrations or intakes.

3. Initial Toxicity Assessment (to be performed in conjunction with 5.D.1. and 5.D.2. above, as applicable)

The respondent shall perform a literature review of information regarding the toxicity, fate and transport characteristics, ecological effects, and likely biological receptors for the contaminants of concern.

4. Preliminary Ecological Assessment

The respondent shall combine the results of Tasks 5.D.1. to 5.D.3., above in order to define or evaluate the following on a site-specific basis:

a. Initial identification of exposure pathways and ecological receptors;

b. The existence of or potential for current and future adverse effects to occur on a population, community or ecosystems level; and

c. Determine if the results of the Phase I Ecological Assessment indicate the need for further ecological studies.

5. Phase II Ecological Assessment

Respondent shall prepare and implement, following Ohio EPA approval, a detailed work plan for further site investigations that shall be compatible with requirements listed in 4.D.3, but also include the following:

a. Study objectives and relevance to risk assessment objectives;

b. Identification of ecological measurement endpoints, assessment endpoints, and endpoint selection criteria;

c. Semiquantitative and quantitative surveys of flora and fauna;

d. Chemical sampling in potentially exposed habitats and reference sites;

e. Laboratory and in situ toxicity testing; and

f. Tissue analyses.

6. Ecological Assessment Report

The respondent shall prepare a report including all results from Tasks 5.D.1. to 5.D.5. above for incorporation into the Environmental Risk Assessment (see

OHIO E.P.A. SEP 27 '95
DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Marie Cain

Task 6).

Special Note: Because seasonal effects can impart a profound influence on the results of biological or ecological sampling, the Ohio EPA requires that all sampling or testing of flora and fauna shall take place between April 1 and October 30 unless otherwise approved by the Site Coordinator.

E. Potential Receptor Identification

The Respondent shall collect data describing the human populations, plant and animal populations, communities, and ecosystems that are or may be susceptible to contaminant exposure from the Site. Chemical analysis of biological samples or data on observable effects in ecosystems may be needed to properly identify biological receptors. Some of this information shall be obtained from information gathered during the Ecological Assessment (see Task 5.D.). The following characteristics shall be identified:

1. Local current and potential future uses of ground water:

   a. Type of use (e.g., municipal or residential, agricultural, domestic/non-potable and industrial, nonagricultural use by flora and fauna); and

   b. Location of ground water users including wells and discharge areas.

2. Local current and potential future uses of surface waters in the vicinity of the Site:

   a. Type of use (e.g., municipal or residential, agricultural, domestic/non-potable and industrial, nonagricultural use be flora and fauna); and

   b. Location of surface water users or use areas.

3. Use of or access by humans or biota to the site or facility and adjacent lands, including but not limited

OHIO E.P.A. SEP 27 95 FILED DIRECTOR'S JOURNAL

to:

a. Recreational;

b. Hunting;

c. Residential;

d. Commercial;

e. Zoning;

f. Nonagricultural use by flora and fauna; and

g. Future land use or access.

4. A demographic profile of the people who use or who have access to the facility and adjacent land including, but not limited to age, sex and sensitive subgroups.

F. RI Report

The Respondent shall prepare a Remedial Investigation (RI) Report to present Task 5, above, and Tasks 6 and 7, described below. The RI Report shall be developed in draft form for Ohio review and approval (refer to Section XIV of this Order, Review of Submittals). The report shall describe the nature and extent of contamination (qualitative/quantitative) in relation to background areas indicative for the area.

TASK 6 -- HUMAN HEALTH BASELINE RISK ASSESSMENT

The Respondent shall prepare a thorough analysis and summary of all Site investigations and their results. The objective of this task will be to ensure that the investigation data are sufficient in quality (e.g, quality assurance procedures have been followed) and quantity to adequately describe the nature and extent of contamination, actual and potential future threats to human health and/or the environment and to support the feasibility study.

The results and data from all site investigations shall be organized and presented logically so that the relationships between

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

and among remedial investigations for all media and receptors are apparent.

A. Conceptual Site Model.

In order to expedite review and approval of the Human Risk Assessment by the Ohio EPA the Respondent shall prepare a Conceptual Site Model (CSM) prior to completing the Human Risk Assessment Report. The CSM is an interim document that shall briefly describe the following in tables or lists based on pre-existing site information and information gathered to date during the RI:

1. Goals of the assessment;

2. Types and sources of information or data that will be used in the assessment;

3. Major assumptions or limitations influencing the application of the assessment;

4. Criteria for selecting chemicals of concern;

5. Exposure pathways, scenarios, and assumptions; and

6. Other interim deliverables.

B. Human Risk Assessment Report.

Based upon the CSM, the Respondent shall prepare a risk assessment which shall contain a discussion of and present the data required in the tasks outlined below:

1. Selection of Contaminants of Concern. Respondent shall:

   a. Evaluate data based on approved data useability procedures (e.g., laboratory or data validation qualifiers, frequency and contaminant concentrations);

   b. Further reduce the number of chemicals of concern based on chemical toxicity to human and biological receptors, number of chemicals, environmental mobility, background data, etc.; and

c. Develop a final list of Contaminants of Concern.

2. Estimate of Exposure Point Concentrations of Indicator Chemicals. Respondent shall:

   a. Combine site monitoring data and environmental modeling results to:

      i) identify exposure pathways;

      ii) estimate exposure point concentrations; and

      iii) compare these concentrations to requirements, standards and criteria.

3. Estimate of Chemical Intakes. Respondent shall:

   a. Provide estimates of chemical intakes from:

      i) Air

      ii) Ground water

      iii) Surface water

      iv) Other exposure pathways (soils, food-stuffs, recreation, etc.)

   b. Combine pathway-specific intakes to yield total oral and total inhalation routes.

4. Respondent shall evaluate critical toxicity values (i.e., numerical values describing a chemical toxicity) and review general toxicological information for the indicator chemicals.

5. Risk Characterization. Respondent shall provide a detailed characterization of the risk posed by releases of toxic chemicals from the site. The characterization shall include the following elements:

   a. Noncarcinogenic effects using the Hazard Index approach, where:

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cain Date 9-27-95

HI = E(1)/RL(1) + E(2)/RL(2) + ... E(i)/RL(i)

E(i) = Exposure level (or intake) for the (i)th toxicant

RL(i) = Reference level (or intake) for the (i)th toxicant

b. Potential carcinogenic effects using the predicted risk approach, where:

Risk = CDI x Carcinogenic Potency Factor

CDI = Chronic Daily Intake

It is assumed that risks are additive and there is independence of action by the compounds involved. Therefore, the following equations are used:

Carcinogenic risk for chemical X = [CDI (inhalation) x PF (inhalation)] + [CDI (oral) x PF (oral)]

Total carcinogenic risk = (carcinogenic risk for chemical 1 + carcinogenic risk for chemical 2 + ... + carcinogenic risk for chemical (i))

c. Uncertainties.

Respondent shall provide a discussion of the uncertainties and assumptions made in the assessment process.

TASK 7 -- ENVIRONMENTAL BASELINE RISK ASSESSMENT.

The Respondent shall prepare a risk assessment which shall contain a discussion of present and future potential risk to ecosystems and populations exposed to contamination; information necessary to evaluate the environmental impact of proposed remedial alternatives; and information that can be utilized for the development of subsequent cleanup criteria in the tasks outlined below (note the Site Coordinator may approve combination of Tasks 6 and 7 into a single set of deliverables):

SUBJECT: GENERIC STATEMENT OF WORK, REMEDIAL INVESTIGATION/FEASIBILITY STUDY, STATE VERSION

A. Conceptual Site Model.

The respondent shall prepare an interim document as defined in Task 6.A. above with emphasis on site ecology and biological receptors.

B. Environmental Risk Assessment Report

1. Briefly Describe the Site and Study Area:

   a. Describe physical and chemical factors that impact site ecology (e.g., fate and transport of contaminants, bioavailability, etc.);

   b. Describe past or current practices, disturbances, or stresses that impact(ed) site ecology;

   c. Describe the areal extent of environmental assessment;

   d. Provide a full account of ecosystems and populations potentially exposed to contamination; and

   e. Describe current and projected land use in and around the site as relevant to site ecology.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
...ERED DIRECTOR'S JOURNAL

2. Describe Contaminants and Ecological Endpoints of Concern:

   a. (See Task 6.B.1);

   b. Specifically consider contaminants that pose toxicity or bioaccumulation potential to biological receptors and/or are available for exposure to populations and ecosystems; and

   c. Measurement and assessment endpoints and indicator species and rationale for their selection.

3. Characterize Exposure:

   a. Combine site data, environmental modeling results and peer reviewed scientific literature to:

      i) identify exposure pathways; and

      ii) estimate exposure point concentrations by species, habitat, and exposure scenario; and

      iii) identify site specific fate and transport processes.

   b. Verify exposure to populations or ecosystems:

      i) show correlations between concentrations and appropriate ecological endpoints (e.g., toxicity tests and population studies) along likely exposure pathways; and

      ii) compare data from other toxicity tests, population studies, modeled uptakes,or reference areas to show exposure has occurred.

4. Characterize Risk or Threat.

   The Respondent shall discuss and reduce the uncertainty over the receptor populations, communities, or ecosystems that are or may be affected; the estimation that adverse effect(s) will or are occur(ring); the magnitude of such an effect(s); and the temporal character of such an

effect(s) by:

a. Identifying requirements, standards and criteria;

b. Identifying relevant, peer reviewed literature toxicity values or toxicological effects where the above are lacking;

c. Comparison of exposure concentrations to a. and b. above, using suitable uncertainty factors and considering both chronic and acute endpoints;

d. Presenting the number and magnitude of exceedances of a and b above;

e. Presenting supporting evidence of risk from:

i) contaminant concentrations in biota;

ii) toxicity test results;

iii) supporting literature;

iv) field surveys of receptor populations;

v) measures of community structure and ecosystem function;

vi) comparison with reference or background data or observations; and

f. Discussing adverse or potential adverse effects under future use conditions.

5. Summary and Conclusions:

a. Summarize effects or potential effects of contamination to biological populations, communities or ecosystems under current and future use conditions;

b. Describe future effects in absence of remedial action; and

c. Describe population, community or ecosystem characteristics that may impact the nature of remedial

OHIO E.P.A
SEP 27 95
FILED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

actions.

6. Assessment of Uncertainties and Limitations:

   a. Describe all sources of uncertainty (e.g., variance estimates, underlying model assumptions, lack of toxicity information, unexpected influences on ecological assessment, etc.), their magnitude and direction of impact on estimation of risk; and

   b. Describe assessment limitations (e.g., deviations from intended goals, data gaps, etc.).

TASK 8-DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES

The development and screening of remedial alternatives is performed to develop an appropriate range of waste management options that will be evaluated. This range of alternatives should include as appropriate, options in which treatment is used to reduce the toxicity, mobility, or volume of wastes, but varying in the types of treatment, the amount treated, and the manner in which long-term residuals or untreated wastes are managed; options involving containment with little or no treatment; options involving both treatment and containment; and a no-action alternative. The following activities will be performed by the Respondent as a function of the development and screening of remedial alternatives.

The Respondent will begin to develop and evaluate a range of appropriate waste management options that at a minimum ensure protection of human health and the environment, concurrent with the RI site characterization tasks.

A. Remedial Action Objectives

1. Develop and document remedial action objectives

The Respondent shall develop preliminary remedial objectives, specifying the contaminant(s) and media or medium of interest, exposure pathway and preliminary remediation goals that establish a range of treatment and containment alternatives to be evaluated.

These remedial action objectives shall be based on

information gathered during the Remedial Investigation, Ohio EPA's How Clean Is Clean policy and other pertinent Ohio EPA guidance, chemical specific ARAR's, when available other information (e.g., Rfds) and site specific factors, and shall be not inconsistent with section 300.430 of the NCP. Final remediation goals shall be determined by the Ohio EPA at or after the point the remedy is selected and are not part of this order.

In order to expedite review and approval of the Feasibility Study, the Respondent shall prepare a technical memorandum outlining the remedial action objectives.

OHIO E.P.A. SEP 27 95 ENTERED DIRECTOR'S JOURNAL

B. Technologies Screening

1. Develop general response actions

The Respondent shall develop general response actions for each medium of interest defining containment, treatment, excavation, pumping, or other actions, singly or in combination, to satisfy the remedial action objectives.

2. Identify areas or volumes of media

The Respondent shall identify volumes of media to which general response actions may apply, taking into account requirements for protectiveness as identified in the remedial action objectives. The chemical and physical characterization of the Site will also be taken into account.

3. Identify, screen, and document remedial technologies

The Respondent shall identify and evaluate technologies applicable to each general response action to eliminate those that cannot be implemented at the Site. General response actions will be refined to specify remedial technology types. Technology process options for each of the technology types will be identified either concurrent with the identification of technology types, or following

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Maria Cavin Date 9-27-95

the screening of the considered technology types. Process options shall be evaluated on the basis of effectiveness, implementability, and cost factors to select and retain one or, if necessary, more representative process for each technology type. Evaluation should typically focus on effectiveness factors at this stage with less effort directed at the implementability and cost factors. The technology types and process options will be documented for inclusion in the Alternatives Array Report as described below under Task 8.C.4. The reasons for eliminating technologies must be specified.

C. Alternatives Array

1. Assemble and document alternatives

The Respondent shall assemble selected representative technologies into alternatives for each affected medium or operable unit. Together, all of the alternatives will represent a range of treatment and containment combinations that will address either the Site or the operable unit as a whole. A summary of the assembled alternatives will be prepared by the Respondent for inclusion in the Alternatives Array Report described below. The reasons for eliminating alternatives during the preliminary screening process must be specified.

2. Refine alternatives

The Respondent shall refine the remedial alternatives to identify contaminant volume addressed by the proposed process and sizing of critical unit operations as necessary. Sufficient information will be collected for an adequate comparison of alternatives. Remedial action objectives for each medium will also be refined as necessary to incorporate any new risk assessment information being generated from the remedial investigation. Additionally, Ohio EPA will update ARARs as the remedial alternatives are refined.

3. Conduct and document screening evaluation of each alternative

The Respondent may perform a final screening process

based on short and long term aspects of effectiveness, implementability, and relative cost. Generally, this screening process is only necessary when there are many feasible alternatives available for detailed analysis. If necessary, the screening of alternatives will be conducted to assure that only the alternatives with the most favorable composite evaluation of all factors are retained for further analysis.

As appropriate, the screening will preserve the range of treatment and containment alternatives that was initially developed. The range of remaining alternatives will include options that use treatment technologies and permanent solutions to the maximum extent practicable, and minimize media transfer. The Respondent shall prepare a summary of the results and reasoning employed in the screening, the assembly of alternatives that remain after screening. The summary will be submitted with the Alternatives Array Report as described below.

4. Alternatives Development and Screening Deliverables

In order to expedite review and approval of the Feasibility Study, the Respondent will prepare an Alternatives Array Report summarizing the work performed in and the results of each activity described above under Task 8, including an Alternatives Array summary. These alternatives shall be modified by the Respondent, if required by Ohio EPA's comments to assure identification of a complete and appropriate range of viable alternatives to be considered in the detailed analysis. This interim deliverable will document the methods, rationale, and results of the alternatives screening process. The Respondent will refer to the U.S.EPA Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA for an outline of the report format and the required report contents. This report will become a major portion of the Feasibility Study Report to be submitted as part of Task 10.B.

Based upon the Alternatives Array Report, the Ohio EPA shall identify and provide to the Respondent ARARs for the range of alternatives presented. These ARARs may be modified by the Agency based upon the results of other tasks of this SOW.

OHIO E.P.A. SEP 27 '95
...ED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

SUBJECT: GENERIC STATEMENT OF WORK, REMEDIAL INVESTIGATION/FEASIBILITY STUDY, STATE VERSION

TASK 9 -- TREATABILITY STUDY

A. Treatability Study Work Plan

1. Determining the Need for Treatability Studies

   a. Ohio EPA Required Treatability Studies

      The Respondent shall conduct any necessary laboratory and treatability study(ies) required by the Ohio EPA to determine the applicability of remedial technologies.

   b. Respondent-Proposed Treatability Studies

      Upon approval by the Ohio EPA, the Respondent may conduct any laboratory and treatability study(ies) that it has proposed to the Agency to determine the applicability of remedial technologies.

2. Treatability Study Work Plan

   When required or approved of by the Ohio EPA, the Respondent shall develop and submit to this Agency for approval a testing work plan identifying the type(s) and goal(s) of the treatability study(ies), the level of effort needed, the experimental design, and the procedures to be used for data management, validation and interpretation. This work plan shall comport with U.S. EPA's guidance document, Guide for Conducting Treatability Studies Under CERCLA (Interim Final) EPA/540/2-89/058.

   The work plan shall include the following elements:

   a. Establishing data quality objectives

   b. Selecting a contracting mechanism

   c. Issuing the Work Assignment

   d. Compliance with regulatory requirements

   e. Execution of the study

f. Analyzing and interpreting the data

g. Reporting the results

h. Sampling and Analysis Plan

i. Health and Safety Plan

B. Treatability Study Evaluation Report

1. Conducting a Treatability Study

The Respondent will perform the treatability study in accordance with the approved work plan in a systematic fashion to ensure that the data generated can support the remedy evaluation process.

2. Submission of Treatability Study Evaluation Report

Upon completion of the treatability study(ies), the Respondent will prepare a treatability study evaluation report. The Respondent will follow U.S. EPA's guidance document, Guide for Conducting Treatability Studies Under CERCLA (Interim Final) EPA/540/2-89/058, for the appropriate format and content.

TASK 10 -- DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES

A. Detailed Analysis of Alternatives Report

The detailed analysis will be conducted by the Respondent to provide the Ohio EPA with the information needed for the selection of a site remedy. Respondent shall conduct a detailed analysis of the alternatives that pass through the initial screening. This detailed analysis shall consist of an analysis of each option against a set of eight evaluation criteria and a comparative analysis of all options using the same evaluation criteria as a basis for comparison.

The detailed analysis shall consist of the following elements:

1. Detailed Description

OHIO E.P.A.
SEP 27 95
RECORDED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

The detailed description of each remaining alternative shall include as a minimum:

a. Description of appropriate treatment and disposal technologies;

b. Special engineering considerations required to implement the alternative, e.g., pilot treatment facility or additional studies needed to proceed with final remedial design;

c. Operation, maintenance and monitoring requirements of the completed remedy;

d. Off-site disposal needs and transportation plans;

e. Temporary storage requirements;

f. Safety requirements for remedial implementation, including both on-site and off-site health and safety considerations;

g. An analysis of how the alternatives could be phased into individual operations and a discussion of how these operations could best be implemented (individually or in groups) to produce significant environmental improvement;

h. A review of any off-site treatment or disposal facilities to ensure compliance with RCRA, TSCA and State requirements, both current and proposed; and

i. An analysis of the projected performance and expected results of the alternative with emphasis on potential for further future release of hazardous substances.

2. Environmental Assessment

An Environmental Assessment (EA) shall be performed for each alternative including, as a minimum, an evaluation of each alternative's environmental effects, an analysis of measures to mitigate adverse effects, physical or legal constraints and compliance with Federal and State regulatory requirements.

Each alternative will be assessed in terms of the extent to which it will mitigate damage to or protect public health, welfare and the environment, in comparison to the other remedial alternatives.

The no action alternative will be fully evaluated to describe the current site conditions and anticipate environmental conditions if no actions are taken. The no action alternative will serve as a baseline for the Environmental Assessment.

OHIO E.P.A. SEP 27 95 DIRECTOR'S JOURNAL

3. Apply Eight Criteria and Document Analysis

The respondent shall apply the eight evaluation criteria described below to the assembled remedial alternatives.

a. Overall Protection of Human Health and the Environment.

Alternatives shall be assessed as to whether they can adequately protect human health and the environment from unacceptable risks posed by hazardous substances, pollutants or contaminants present at the site by eliminating, reducing or controlling exposures to levels established during development of remediation goals. This is a threshold requirement and the primary objective of the remediation program.

b. Compliance with Applicable or Relevant and Appropriate Requirements.

The alternatives shall be assessed as to whether they attain applicable or relevant and appropriate standards, criteria and requirements of state and federal environmental and public health laws.

c. Long-term Effectiveness and Permanence.

Alternatives shall be assessed for the long-term effectiveness and permanence they afford, along with the degree of certainty that the alternative will prove successful. Factors that shall be considered, as appropriate, include the following:

i) Nature and magnitude of total residual risks;

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

potential for exposure of human and environmental receptors; concentrations of hazardous substances, pollutants or contaminants remaining following implementation of remedial alternative, considering the persistence, toxicity, mobility and propensity to bioaccumulate of such hazardous substances and their constituents;

ii) The type, degree and adequacy of long-term management required for untreated substances and treatment residuals, including engineering controls (such as containment technologies), institutional controls, monitoring and operation and maintenance;

iii) Long-term reliability of the engineering and institutional controls, including uncertainties associated with land disposal of untreated hazardous substances, pollutants and contaminants, as well as treatment residuals, and;

iv) Potential need for replacement of the remedy, as well as the continuing need for repairs to maintain the performance of the remedy.

d. Reduction of Toxicity, Mobility or Volume.

The degree to which alternatives employ treatment that reduces toxicity, mobility or volume of contaminants shall be assessed. Alternatives which, at a minimum, address the principal threats posed by the site through treatment shall also be identified. Factors that shall be considered, as appropriate, include the following:

i) The treatment or recycling processes the alternatives employ and materials they will treat;

ii) The amount of hazardous substances, pollutants or contaminants that will be destroyed, or treated, or recycled;

iii) The degree of expected reduction in toxicity, mobility or volume of the waste due to treatment or recycling and the specifications of which reduction(s) are occurring;

iv) The degree to which the treatment is irreversible;

v) The type and quantity of residuals that will remain following treatment, considering the persistence, toxicity, mobility and propensity to bioaccumulate;

vi) The degree to which treatment will reduce the inherent hazards posed by the principal threats at the Site; and

vii) The degree to which the treatment processes employed reduce the transfer of contaminants between environmental media.

e. Short-term Effectiveness.

The short-term impacts of the alternatives during the construction and implementation phase, and until the objectives of the remedial action have been met, shall be assessed considering the following:

i) Short-term risks that may be posed to the community during construction and implementation of an alternative and until the remedial action objectives have been met;

ii) Potential impacts on workers during remedial action and with the objectives of remedial action have been met, the effectiveness and reliability of protective measures;

iii) Potential environmental impacts that may result from the remedial action and the effectiveness and reliability of mitigative measures during implementation and until the objectives of the remedial action have been met; and

iv) Time until response action objectives are

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

OHIO E.P.A. SEP 27 '95 DIRECTOR'S JOURNAL

achieved.

f. Implementability.

The technical and administrative feasibility of implementing the alternatives shall be assessed by considering the following types of factors, as appropriate:

i) Technical Feasibility

- Degree of difficulty or uncertainty associated with construction and operation of the alternative;
- Expected operational reliability of the alternative;
- Ease of undertaking, additional remedial action(s); and
- Ability to monitor the effectiveness of the remedy.

ii) Administrative Feasibility

- Activities needed to coordinate state, local, and federal agencies (e.g., obtaining necessary approvals and permits, right-of-way for construction)

iii) Feasibility of Obtaining Services and Materials

- Capacity and location of adequate treatment, storage, and disposal services;
- Availability of necessary equipment and specialists and provisions to ensure any necessary additional resources;
- Availability of services and materials; and
- Availability of prospective technologies

g. Cost.

The types of costs that shall be assessed include the following:

i) Direct and indirect capital costs, including contingency and engineering fees;

ii) Annual operation and maintenance costs; and

iii) Net present value of capital and O&M costs.

h. Community Acceptance.

This assessment includes determining which components of the alternatives interested persons in the community support, have reservations about, or oppose. This assessment, which will be completed by the Ohio EPA, will occur throughout the implementation of this RI/FS and will be completed after comments on the proposed remedy are received. It is not part of this order.

4. Compare Alternatives Against Each Other and Document the Comparison of Alternatives

The Respondent will perform a comparative analysis between the remedial alternatives. That is, each alternative will be compared against the others using the evaluation criteria as a basis of comparison. Identification and selection of the preferred alternative are reserved by the Ohio EPA and are not part of this Order. The comparative analysis will be documented and presented in the Feasibility Study Report described below.

B. Feasibility Study Report

The Respondent will submit a draft feasibility study report to the Ohio EPA for review, comment, and approval. This report will include the results of Tasks 9 and 10. The respondent will refer to the U.S.EPA Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA for an outline of the report format and the required report content. Upon satisfactorily addressing Ohio EPA's comments, the Respondent will prepare and submit a final feasibility study report.

OHIO E.P.A. SEP 27 '95
RECORDED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

SUBJECT: GENERIC STATEMENT OF WORK, REMEDIAL INVESTIGATION/FEASIBILITY STUDY, STATE VERSION

TASK 11 -- Monthly Progress Reports

Monthly Technical Progress Reports are required of the Respondent. For each on-going work assignment, Respondent shall submit progress reports with the following elements:

1. Identification of site and activity.
2. Status of work at the site and progress to date.
3. Percentage of completion.
4. Data generated to date
5. Difficulties encountered during the reporting period.
6. Actions being taken to rectify problems.
7. Activities planned for the next month.
8. Changes in personnel.

The monthly progress report will list target and actual completion dates for each activity including project completion and provide an explanation of any deviation from the milestones in the work plan schedule.

Appendix B

OHIO EPA AND U.S. EPA GUIDANCE DOCUMENTS

Statement of Purpose and Use of This Guidance Document List:
The purpose of this list of Ohio EPA and U.S. EPA policies, directives and guidance documents is to provide a reference of the documents which provide essential direction and guidance for conducting investigations, evaluating alternative remedial actions, and designing and implementing selected remedial actions at sites for which the Division of Emergency and Remedial Response has authority over such activities. Certain sites may have contaminants or conditions which are not fully addressed by the documents in this list. There is an evolving body of policy directives, guidance and research documentation which should be utilized, as necessary, to address those conditions and contaminants not encompassed by the documents in this list. For sites where activities are conducted in response to an administrative or judicial order, this list would be an attachment to the order and would govern the work conducted pursuant to it. When entering into or issuing an order for a particular site, Ohio EPA reserves the right to modify this list to fully address the site conditions.

OHIO EPA POLICIES AND GUIDANCE DOCUMENTS

1. Background Sampling Guidance, Final, Ohio EPA, Division of Emergency and Remedial Response, July 26, 1991

2. Best Available Treatment Technologies (BATT) for Remedial Response Program Sites, Ohio EPA Policy No. DERR-00-RR-016, Final, October 23, 1992

3. Guidelines and Specifications for Preparing Quality Assurance Project Plans, Ohio EPA, Division of Emergency and Remedial Response, Policy No. DERR-00-RR-008, March 1990

4. How Clean is Clean, Final, Ohio EPA, Division of Emergency and Remedial Response, Policy No. DERR-00-RR-009, July 26, 1991

5. Procedures for Evaluation of Response Action Alternatives and Remedy Selection for Remedial Response Program Sites, Ohio EPA Policy No. DERR-00-RR-019, Final, October 23, 1992

6. Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring Programs, Ohio EPA, Division of Drinking and Ground Waters, Final, February 1995

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95
OHIO E.P.A. SEP 27 95
RECORDED DIRECTOR'S JOURNAL

7. Wastewater Discharges Resulting from Clean-Up of Response Action Sites Contaminated with Volatile Organic Compounds, Ohio EPA Policy No. DSW-DERR 0100.027, Final, September 22, 1994

Also, if there are any aquatic ecological concerns for the site under investigation please consult the following Biological Criteria documents:

8a. Biological Criteria for the Protection of Aquatic Life: Volume I. The Role of Biological Data in Water Quality Assessment. Ohio EPA, Division of Surface Water, 1987

8b. Biological Criteria for the Protection of Aquatic Life: Volume II. Users Manual for Biological Field Assessment of Ohio Surface Waters. Ohio EPA, Division of Surface Water, 1987

8c. Addendum to Biological Criteria for the Protection of Aquatic Life: Volume II. Users Manual for Biological Field Assessment of Ohio Surface Waters. Ohio EPA, Division of Surface Water, 1989

8d. Biological Criteria for the Protection of Aquatic Life: Volume III. Standardized Biological Field Assessment of Ohio Surface Waters. Ohio EPA, Division of Surface Water, 1989

8e. Rankin, E.T. 1989. The Qualitative Habitat Evaluation Index (QHEI): Rationale, Methods, and Application. Ohio EPA, Division of Surface Water, 1990

U.S. EPA GUIDANCE DOCUMENTS AND OTHER USEFUL GUIDANCE

9. CERCLA Compliance with Other Laws Manual - Part I, OSWER Directive 9234.1-01, EPA/540/G-89/006, August 1988, interim final

10. CERCLA Compliance with Other Laws Manual - Part II, OSWER 9234.1-01, EPA/540/G-89/006, August 1988, interim final

10. A Compendium of Technologies Used in the Treatment of Hazardous Wastes, EPA/625/8-87/014, September 1987

12. A Rationale for the Assessment of Errors in the Sampling of Soils, EPA/600/4-90/013, July 1990

13. Assessment of Technologies for the Remediation of Radioactively Contaminated Superfund

OHIO E.P.A.
SEP 27 95
DIRECTOR'S JOURNAL
I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: Mary Cavin Date 9-27-95

Sites, EPA/540/2-90/001, January 1990

14. Closure of Hazardous Waste Surface Impoundments, SW-873, September 1980

15. Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites, OSWER Directive 9355.3-11, EPA/540/P-91/001, Feburary 1991

16. Data Quality Objectives Process for Superfund, Interim Final Guidance, OSWER Directive 9355.9-01, EPA540-R-93-071, September 1993

17. Ecological Assessments of Hazardous Wastes Sites: A Field and Laboratory Reference, EPA/600/3-89/013, March 1989

18. Exposure Factors Handbook, EPA/600/8-89/043, March 1990

19.* Guidance for Remedial Actions for Contaminated Ground Water at Superfund Sites, OSWER Directive 9283.1-2, EPA/540/G-88/003, December 1988, interim final

20. Guidance for Conducting Remedial Investigation and Feasibility Studies under CERCLA, Interim Final, OSWER 9355.3-01, EPA/540/G-89/004, October 1988

21.* Guidance on Remedial Actions for Superfund Sites with PCB Contamination, OSWER Directive 9355.4-01, EPA/540/G-90/007, August 1990

22. Guidance Document on the Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities, EPA, 1989

23. Guidance on Applying the Data Quality Objectives Process for Ambient Air Monitoring Around Superfund Sites (Stages 1 & 2), EPA/450/4-89/015, August 1989

24. Guidance for Data Usability in Risk Assessment, OSWER Directive 9285.7-05, EPA/540/G-90/008, October 1990, interim final

25.* Guide for Decontaminating Buildings, Structures, and Equipment at Superfund Sites, EPA/600/2-85/028, March 1985

26. Guide for Conducting Treatability Studies Under CERCLA: Soil Vapor Extraction, EPA/540/2-91/019A, September 1991, interim guidance

27. Guide for Conducting Treatability Studies Under CERCLA: Aerobic Biodegradation

O.E.P.A. SEP 27 95 DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

Remedy Screening, EPA/540/2-91/013A, July 1991, interim guidance

28. Guide for Conducting Treatability Studies Under CERCLA, EPA/540/2-89/058, December 1989, interim final

29. Handbook - Permit Writer's Guide to Test Burn Data - Hazardous Waste Incineration, EPA/625/6-86/012, September 1986

30.* Handbook - Quality Assurance/Quality Control (QA/QC) Procedures for Hazardous Waste Incineration, EPA/625/6-89/023, January 1990

31. Handbook - Dust Control at Hazardous Waste Sites, EPA/540/2-85/003, November 1985

32.* Handbook - Guidance on Setting Permit Conditions and Reporting Trial Burn Results - Volume II of the Hazardous Waste Incineration Guidance Series, EPA/625/6-89/019, January 1989

33. Handbook on In Situ Treatment of Hazardous Waste-Contaminated Soils, EPA/540/2-90/002, January 1990,

34. Handbook for Stabilization/Solidification of Hazardous Wastes, EPA/540/2-86/001, June 1986

35. Handbook - Hazardous Waste Incineration Measurement Guidance Manual - Volume III of the Hazardous Waste Incineration Guidance Series, EPA/625/6-89/021, June 1989

36. Leachate Plume Management, EPA/540/2-85/004, November 1985

37. Preparation Aids for the Development of Category 1 Quality Assurance Project Plans, EPA/6008-91-003, February 1991

38. Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures,Interim Final, EPA/540/G-90/004, April 1989

39. RCRA Ground Water Monitoring Technical Enforcement Guidance Document (TEGD), OSWER Directive 9950.1, September 1986

40. Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
RECORDED DIRECTOR'S JOURNAL

41. Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part B), "Development of Risk-based Preliminary Remediation Goals," OSWER Directive 9285.7-01B, December 1991, Interim

42. Risk Assessment Guidance for Superfund: Volume II -Environmental Evaluation Manual, OSWER Directive 9285.7-01, EPA/540/1-89/001A, March 1989, interim final

43. Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual, Supplemental Guidance: "Standard Default Exposure Factors," OSWER Directive 9285.6-03, March 1991, interim final

44. Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part C), "Risk Evaluation of Remedial Alternatives," OSWER Directive 9285.7-01C, December 1991, Interim

45.* Seminar Publication - Requirements for Hazardous Waste Landfill Design, Construction, and Closure, EPA/625/4-89/022, August 1989

46. SW 846, Test Methods for Evaluating Solid Waste, 3rd Edition and appropriate updates, November 1986.

47. Stabilization/Solidification of CERCLA and RCRA Wastes - Physical Tests, Chemical Testing Procedures, Technology Screening and Field Activities, EPA/625/6-89/022, May 1989

48. Standard Methods for the Examination of Water and Wastewater, American Public Health Association, 18th Edition, 1992

49.* Superfund Remedial Design and Remedial Action Guidance, OSWER 9355.0-4A, June 1986

50. Superfund Exposure Assessment Manual, OSWER Directive 9285.5-1, EPA/540/1-88/001, April 1988

51. Superfund Ground Water Issue: Ground Water Sampling for Metals, EPA/540/4-89/001, March 1989

52.* Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments, EPA/530-SW-89-047, July 1989

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
RECORDED DIRECTOR'S JOURNAL

53.* Technical Guidance Document: Inspection Techniques for the Fabrication of Geomembrane Field Seams, EPA/530/SW-91/051, May 1991

54. Technical Guidance for Corrective Measures - Subsurface Gas, EPA/530-SW-88-023, March 1985

55. Technical Guidance Document: Construction Quality Assurance and Quality Control for Waste Containment Facilities, EPA/600/R-93/182, September 1993

56. U.S. EPA Integrated Risk Information System (IRIS) Data Base

57. U.S. EPA Health Effects Assessment Summary Tables, Office of Emergency & Remedial Response, published annually

58. U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA-540/R-94-013, February 1994

59. U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA-540/R-94-012, February 1994

60. Ohio EPA Position Paper - definition of "Interim Action", August 20, 1992

Notes:

1) Documents and guidances denoted by an asterisk (*) are those which may be important to the Remedial Design/Remedial Action phase of a project but generally will have limited relevance to the Remedial Investigation/Feasibility Study process.

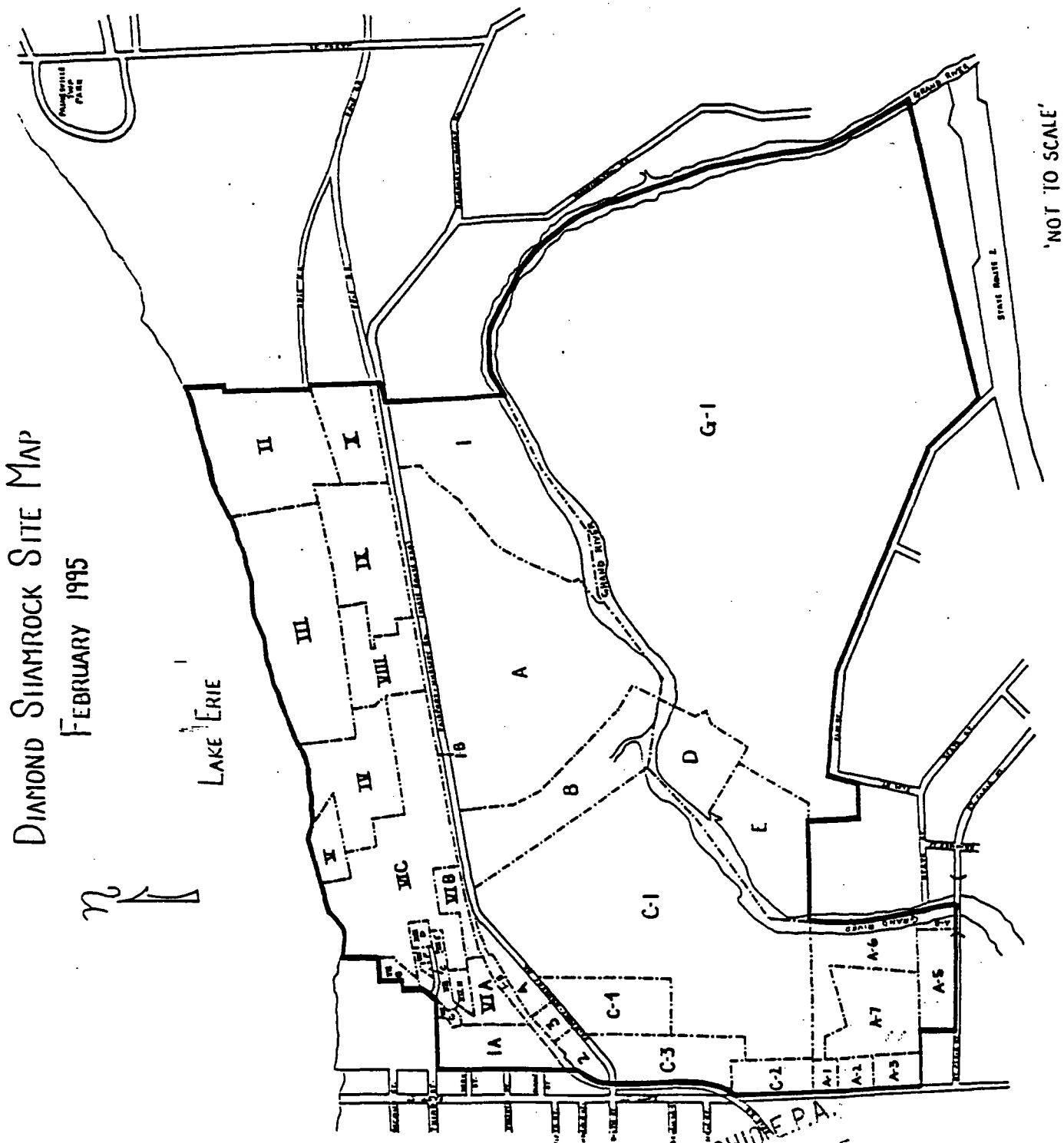
2) This list of guidance documents is updated periodically. You should check with Ohio EPA to verify that this list is the most current available.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date 9-27-95

OHIO E.P.A.
SEP 27 95
FILED DIRECTOR'S JOURNAL

APPENDIX C



I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Mary Cavin Date _____

OHIO E.P.A.
SEP 27 95
ENTERED DIRECTOR'S JOURNAL